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Underlying Mechanisms in Symptoms of Poliomyelitis — GUCKER

Interdepartmental Relations of Ancillary Medical Services — STULL

Passive and Active Stretching of Muscles — WEBER and KRAUS

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Volume 29 **September 1949** **Number 9**

Underlying Mechanisms in Symptoms of Poliomyelitis:

Their Bearing Upon Treatment

Thomas Gucker 3rd, M.D.

Infantile paralysis continues to take its toll in annual unpredictable and unrelenting epidemics. Practically every branch of medical science has been enlisted in one of the most concerted attacks ever launched to conquer a disease. As yet no drug or specific method of treatment has been discovered which prevents or cures paralysis. That point deserves emphasis because in the final analysis the severity of paralysis and of the associated deformities define the extent of the disability from the disease. Furthermore in recent years a number of types of treatment have been advocated and their use has focused attention on certain associated symptoms which have thereby received much emphasis. Although many of the processes by which poliomyelitis affects the body are still imperfectly understood, the crucial factors in the production of its crippling effects have been determined. It is the purpose of this paper to describe some of the mechanisms which produce the important symptoms in poliomyelitis and upon this basis to summarize certain aspects of treatment.

The Clinical Picture of Poliomyelitis

Early in the course of the infection, the symptoms are not specific and may be indistinguishable from many other systemic diseases. Thus, fever, lassitude, sore throat or runny nose, loss of appetite, nausea, vomiting, and constipation are characteristic of a number of illnesses, especially in childhood, but as will be mentioned later, they may indicate the presence of the poliomyelitis virus in these systems of the body. It is now generally agreed that even those with the abortive and nonparalytic forms may have some invasion of the central nervous system even though the effects may not be severe enough to produce recognizable symptoms of this involvement. Evidence of invasion of the central nervous system provides the first suspicious findings and should focus attention on the possibility of poliomyelitis. Those symptoms are: headache, pain in the neck and back and frequently in the muscles of the extremities. There usually is stiffness in the posterior neck and back muscles and often in the hamstrings. The occurrence of paralysis may be delayed for several days and once present, the diagnosis is definite. Whenever the paralysis is of a significant amount, subsequent changes in the involved extremities are common to varying degrees. Paralyzed muscles undergo wasting; contractures of the affected structures may occur; deformities frequently increase and progressively limit function of the parts; the paralyzed extremity often is cold with bluish, dis-

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colored skin, and in a growing child, shortening of the involved limb occurs.

(1) Acute Stage; duration until forty-eight hours after fever subsides
  Preparalytic phase
  Paralytic phase
(2) Convalescent Stage; duration approximately eighteen months
  Sensitive phase; duration—days to weeks
  Asensitive phase until maximal recovery of muscle power occurs
(3) Chronic Stage

Figure 1. The clinical course of poliomyelitis consisting of three stages.

This is the full-blown picture of paralytic poliomyelitis which may be subdivided clinically into three stages: the acute, convalescent, and chronic (Fig. 1). The acute stage lasts throughout the period of fever and for about forty-eight hours thereafter, and it is during this interval that paralysis usually occurs if at all. The convalescent stage begins a few days after fever has subsided for the last time and may have two phases: the sensitive, while muscle tenderness and tightness persist, and the asensitive when those symptoms have abated. The entire convalescent stage may be said to last about eighteen months during which recovery of muscle power is generally completed. The patient then enters the chronic or residual stage. We will next turn our attention to what is going on within the body during these stages.

THE PATHOLOGICAL SEQUENCES[1]

The virus of poliomyelitis apparently gets inside the body by way of the pharynx and intestinal tract. Its presence there, however, may produce no reaction, and not until it somehow penetrates the mucous membrane barrier do symptoms commonly occur. It is possible that the reaction of these tissues to the virus accounts for the sore throat, loss of appetite, nausea and vomiting which are so common in the preparalytic stage. Once the virus actually invades the body's inner sanctum, it enters a nerve trunk and after some hours begins to travel toward the central nervous system at a rate of two to three inches a day. Even when it has reached it, further time is required for the virus to multiply, and, in addition, for it to spread throughout various portions of the central nervous system. During this interval while the virus is already imbedded within nervous tissue, there still may be no symptoms and hence the diagnosis of poliomyelitis often cannot yet be made by objective findings. The recognizable effects in the form of symptoms depend mainly upon the extent of the damage in various areas wherein the virus is located. The damage results from two reactions: one, the direct destruction of certain types of nerve cells, and two, inflammatory changes in the region. The severity of these effects, in turn, is dependent on several factors: the dosage and virulence of the virus and, on the other hand, the local immunity of the nervous tissue by which the invasion is counteracted. Tissue immunity apparently can be reduced considerably by certain means, such as fatigue and chilling of the body, a fact which will be emphasized subsequently. By careful experiments in animals, much of which has been confirmed in man, Bodian[2] has shown that the concentration of virus in the motor nerve cells is high at least one day before paralysis occurs, and that at the same time there is microscopic evidence of damage to those cells. In other words, although the virus may have caused destruction that is definite anatomically, functionally the critical point has not yet been reached so that paralysis can be detected by ordinary examination. While these changes are taking place in the motor nerve cells, a similar process occurs in other parts of the central nervous system, particularly in the midbrain, brain stem, and other regions in the spinal cord. Since the normal functioning of the neuromuscular system depends on the finely integrated interaction of these many parts, various symptoms beside paralysis may appear. The nature and extent of the associated symptoms seem to depend upon the severity of the involvement in these particular portions of the central nervous system. We will confine our discussion to some of the more important symptoms of poliomyelitis whose evolution has been reasonably well explained.

THE BASIS OF CERTAIN SIGNIFICANT SYMPTOMS

Pain: Pain is a common finding in the early stages of poliomyelitis, and several types may often be distinguishable. Pain may consist of sensitivity of the skin, i.e., true hyperesthesia, or spontaneous pain felt in the low back, flanks or extremities especially in adults and at times relieved, rather than aggravated, by motion.[3] Muscle tenderness is another form of pain, usually produced by deep palpation or by putting tension on the muscles. These forms of pain may all be present, but often one type predominates, and the severity and duration of the pain vary considerably.

For years all pain in poliomyelitis was considered to be due to lesions of the posterior (sensory) ganglia and roots and to meningeal irritation since involvement of these structures has been repeatedly demonstrated by postmortem studies.[4-5] Skin tenderness and spontaneous pain may well occur by

this process being a reaction to meningitis and sensory nerve root involvement. Lately attention has been drawn to the possibility that muscular pain may be the result of localized changes in the muscle itself. Knisely[6] has presented evidence in experimental poliomyelitis that local anoxia from changes in circulation in the capillaries may result in pain in the muscle. Others[7-8] have suggested that there is ischemia associated with primary alterations in the autonomic nervous system in early poliomyelitis. Evidence against this explanation is our recent finding that the actual temperatures of the skin and muscles of extremities did not vary significantly from the mean normal range regardless of the amount of sensitivity.[9] Further data is necessary before final conclusions can be made on this point.

Deep muscular tenderness usually is accompanied by spasm of certain muscle groups and is roughly proportional to its degree. This sensitivity is generally diminished by rest, heat, and any measure which reduces the degree of muscular tension. The mechanism producing this type of pain, therefore, appears to be related to that of spasm and will be considered further under that heading.

Muscle Spasm: This symptom of poliomyelitis has been repeatedly emphasized in recent years to such an extent that its significance has overshadowed many other important considerations. The phenomenon is still imperfectly understood, but recently several possible mechanisms have been stressed. The term "spasm" requires some clarification. It is not strictly comparable to spasticity since the latter implies a state of continuous increased tonus in a muscle with exaggerated reflexes as evidence of interference with the normal inhibitory action of the higher centers upon reflex activity of the spinal cord. Such an abnormality may result from lesions located at one or more levels in the central nervous system, including the motor cortex and brain stem, providing that the spinal reflex arc can function. The basis for such spasticity has been demonstrated by Magoun and Rhines,[10] and its occurrence in poliomyelitis experimentally produced in chimpanzees has been shown by Bodian.[11] He infected animals with the virus and sacrificed them when signs of spasticity developed. Microscopic examination revealed lesions in the reticular formation and vestibular nuclei in the brain stem and without evidence of viral damage in the spinal cord. Furthermore in fatal human cases lesions are commonly present in these portions of the brain stem, but certain differences between the animals and human cases must be emphasized.

In the human the phenomenon called spasm is not the same as generalized spasticity seen in the animal. The reflexes may be somewhat overactive and occasionally clonus is observed early in the disease. These findings, however, seldom last longer than a day or so; but muscle spasm may persist for weeks or even months. The explanation again depends upon the complex interaction of the human central nervous system and the severity of damage in its various parts. Although lesions are commonly found in the brain stem even in nonfatal human cases, unlike the chimpanzee experiments already mentioned, evidence of damage is more common in various portions of the spinal cord. The predominant location is in the dorsomedial region of the anterior horns, less often in the ventrolateral and intermediate columns of the gray matter (Fig. 2). Therefore we are not dealing with the effect of an isolated lesion in the central nervous system but with multiple lesions; and, moreover, the extent of interference with function is not uniform in the several parts. No wonder, then, that such conflicting impressions arise when an attempt is made to explain spasm in terms of involvement of only one portion of the central nervous system. One must take into account the severity of dysfunction at all levels including the spinal cord.

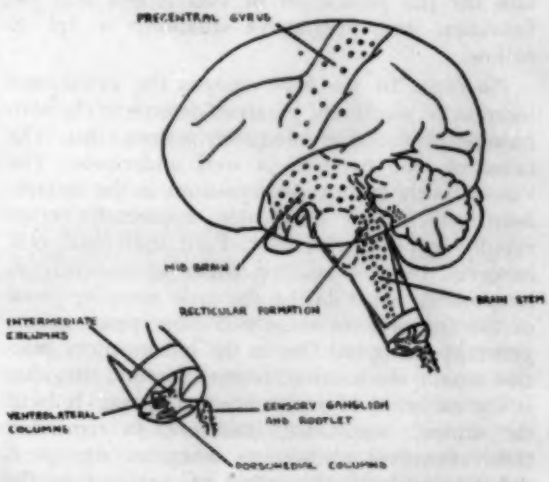

Figure 2. The distribution of lesions in the human central nervous system is indicated by dots. Generalized invasion occurs but the heaviest infiltration is found in the brain stem and anterior horns. Symptoms depend mainly upon the severity of damage in the various regions. Modified from Bodian.

Until the complex mechanism of spasm is fully explained, the important point is to evaluate this symptom honestly. It should be given proper emphasis in the over-all crippling effects of poliomyelitis, but it should not be overstressed in the

treatment. Muscle spasm and pain usually are coexistent in the sensitive phase of the convalescent stage. Anything which increases pain generally also exaggerates the amount of spasm. At times, however, they are dissociated and the subjective pain exceeds the demonstrable spasm. It is conceivable that this dissociation depends upon the presence of complete paralysis so that the spinal reflex arc cannot respond with muscular contraction regardless of the abnormalities of the higher centers. Consequently the importance of spasm depends directly and indirectly upon the severity of paralysis. When no paralysis exists, spasm is no problem, for it is temporary and responds readily to treatment. But when spasm in a muscle is accompanied by significant paralysis either of that muscle or in its antagonist, the ground work is laid for the production of contractures and deformities, and progressive disability is apt to follow.

Paralysis: In the final analysis the extent and location of significant paralysis determine the seriousness of the after-effects of poliomyelitis. The cause of true paralysis is well understood. The virus actively destroys motoneurons in the anterior horn cells.[2] This destruction apparently occurs rapidly within a few days. Each individual cell, however, may be affected either permanently or temporarily. Also during the early sensitive phase of the convalescent stage two other processes are generally going on. One is the inflammatory reaction around the involved motor cells, and the other is the existence of sensitivity and spasm. It is of the utmost importance, therefore, to remember these coexistent phenomena when an attempt is made to evaluate the extent of paralysis in the early days of the illness.

Pain reflexly inhibits muscle contraction that may therefore simulate weakness. Consequently the true physiologic capabilities of muscular function may be obscured, and so long as muscle sensitivity and spasm exist a true estimate of muscle power is exceedingly difficult by manual examination. Nevertheless, one can generally see or feel some active contractile power in a muscle not entirely paralyzed although the effective range of action may be minimal. The true nature of the contraction, however, is dependent upon the number of anterior horn cells which are not functioning at that moment.

Anatomically, approximately 100 to 150 muscle fibers are supplied by a single nerve fiber from an anterior horn cell.[12] Therefore, if such a motor cell ceases to function because of the action of the poliomyelitis virus, that number of muscle fibers will no longer be innervated and cannot contract. The extent of muscle paralysis at that time will then depend upon how many motoneurons, and consequently muscle fibers, are nonfunctioning. Bodian[2] has demonstrated in rhesus monkeys that even in extremities graded as normal by functional activity as many as one-third of the total number of anterior horn cells had been infected by the virus. In man, it can be presumed that a similar factor of safety exists so that before paralysis becomes recognizable, a considerable number of motoneurons must be significantly damaged.

The next point is the consideration of the duration of the dysfunction of the involved cells.[13] Physiologically when a certain amount of destruction occurs in the cell body, function ceases. Anatomically, however, the degree of disruption of the cell may be so slight that it can reconstitute itself in time, which will be considered subsequently. Other cells, also not functioning at that same moment, may have undergone so much damage that recovery is impossible. Once completely destroyed, a cell cannot be replaced by regeneration. The sequence of events following irreparable injury to anterior horn cells involves the nerve fibers and the muscles innervated by those cells.

About three days after total destruction of motoneurons the axons of their nerves begin to degenerate and this process continues for weeks until only the nerve sheaths remain. Meanwhile from the time when the nerves can no longer convey impulses to the muscles, changes occur concomitantly in the muscle fibrils. Each fibril becomes smaller with a loss of muscle glycogen and protein.[14] Eventually the totally paralyzed muscle is replaced by varying amounts of fat and fibrous tissue. During this process another important phenomenon is occurring.

Contractures: When muscles contract normally they glide smoothly within fascial envelopes which are lubricated by tissue fluids similar to the synovial fluid within joints. Motion, however, is the necessary stimulus for the elaboration of this lubricating fluid. Whenever motion is prevented, either because of pain and tightness or from paralysis, the smooth gliding action of the muscles is prevented. In time restricting adhesions form which may be palpable as crepitation along tendon sheaths when the parts are moved. This is especially important when the muscle fibers themselves have undergone atrophy and fibrosis. The muscle then loses its extensibility and tends to remain at the length in which it is maintained most of the time. Eventually the result is a contracture which is painful when put on stretch, and a vicious cycle is set up. The scar tissue, which has replaced muscle, contracts further; the extensibility of the tis-

sues is thereby more restricted and ultimately even the ranges of joint motion become limited. This chain of events is initiated in the sensitive phase of the convalescent stage during the early weeks of the illness. Unless these changes are combatted, the contractures become more fixed and lead to further disturbances.

Deformities: The ideal combination for the production of deformities is the existence of pain and tightness in various muscle groups which are themselves paralyzed in part or totally. The distribution of tightness and paralysis often occurs so that a paretic agonist is opposed by a contracted antagonist. The effects of gravity frequently further exaggerate this imbalance. Deformities are the result. Especially in growing children such contractures and deformities are followed by adaptive changes in the bones which in turn are usually increased by growth.[15] Therefore the more severe and extensive the paralysis, the greater are the chances of deformity. Complete paralysis is irremediable, but proper treatment can do much to prevent the additional insult of deformity.

THE RECOVERY PROCESS

Fortunately it is characteristic of most cases of poliomyelitis that the paralysis is spotty in distribution and exceedingly variable in severity. Even within the same muscle some fibrils undergo atrophy and scarring as already described; others may continue to respond, and still others do not function for a while but are restored to action at a later time. The basis of this recovery apparently depends upon the fact that a number of motoneurons are not permanently damaged but can be reconstituted. Hence, although they were injured by the virus to such an extent that they could not transmit impulses, anatomically the destruction is reversible. The work of Bodian indicates that those anterior horn cells which will recover do so in about a month and even before that time may be able to transmit impulses. Consequently, the degeneration of nerve and muscle fibers is then counteracted. Nonetheless, further time is required before these neuromuscular units are again functioning normally.

As determined by periodic muscle examinations, the gain in muscle power is illustrated by a graph (Fig 3). The degree of increasing power is greatest within the first three months, but further gains continue until about sixteen months after onset. The initial increase apparently is related to the recovery of anterior horn cells although it is possible that the subsidence of the associated inflammatory reaction around the cells may also play a part.

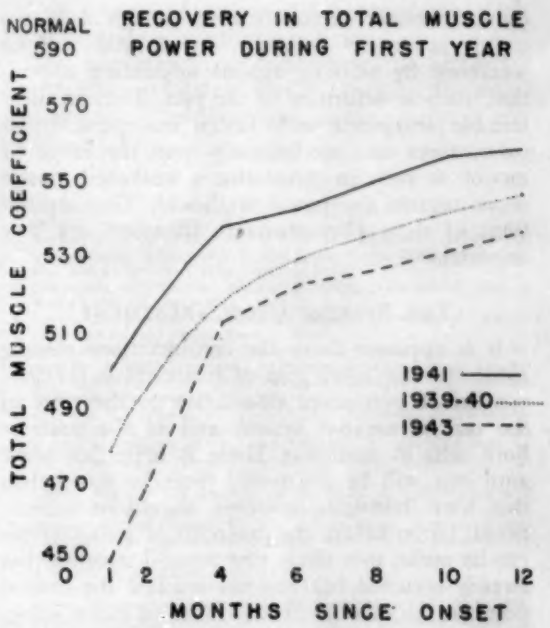

Figure 3. Periodic muscle examinations performed on three groups of patients indicate that the curves of recovery in power are comparable from year to year. The greatest gain occurs in the first six months but improvement is continuing even at the end of a year.

Further improvement may be the result of the actual regeneration of nerve fibers which have undergone partial degeneration before the motoneurons resumed activity. Another possible mechanism is that of arborization whereby as nerve fibers regenerate they enter the sheaths of other destroyed nerves and thereby eventually innervate otherwise functionless muscle fibers.[8] Arborization, however, has not yet been proven to occur in poliomyelitis. The explanation of the further gain in power during the latter part of the convalescent stage probably depends upon two processes. The first is the rerouting of impulses along intact pathways in the central nervous system which previously subserved a different function. As such, this entails a process of relearning which is dependent upon the adaptability of the nervous system to utilize its reserves for new purposes. Secondly, those muscle fibers which function can be made to hypertrophy,[16] and therefore in some measure the deficit in numerical loss of motor units can be overcome.

The ultimate recovery of any muscle, therefore, depends upon the number of fibers which are restored; and in addition to the mechanisms already outlined, other factors deserve attention. It is common knowledge that an overstretched muscle

cannot contract effectively even though its nerve supply is intact.[4] Secondly, any muscle will be weakened by working against unyielding opposition, such as deformity of the part. Thus an inextensible antagonist with fascial and periarticular contractures may mechanically limit the range of motion to such an extent that a weakened muscle never regains the power it should. The implications of these phenomena in treatment are very important.

THE BEARING UPON TREATMENT

It is apparent from the considerations already made that the ideal goal of treatment is the prevention of permanent destruction to the cells in the central nervous system and to the anterior horn cells in particular There is hope that some antibiotic will be discovered that can accomplish this. One limitation, however, should be remembered. Often before the diagnosis of poliomyelitis can be made, it is likely that some destruction has already occurred but has not reached the critical point in the number of cells affected to be recognizable clinically. Therefore the administration of a drug may not have time to be effective before serious further damage is done. The need is for a vaccine which will prevent the virus from causing damage to the central nervous system. Until that is developed, the treatment of poliomyelitis remains symptomatic in a very literal sense.

Pain and muscle spasm must be relieved. When they exist without paralysis, however, they present only a temporary problem.[17] There are many ways by which the sensitivity and increased tonus in the muscles can be overcome. Rest, gentle handling, the use of moist heat, and analgesics have been used successfully for years.[18] Lately various agents such as prostigmine,[19] curare,[20] and most recently procaine and priscoline[21] have been advocated. The effect of these drugs themselves is difficult to evaluate. Under certain circumstances they may be helpful as adjuncts in facilitating the performance of a treatment program. One must remember, however, that there is no evidence that they directly influence the severity of paralysis for their action is not upon the virus nor do they protect the motoneurons from destruction. Their sphere of influence is limited to the associated symptoms of muscle sensitivity and spasm. By themselves they do not prevent muscle inextensibility, fibrosis, contractures, and deformities. If these points are appreciated, such agents can be used wisely; and their true value can be determined. But they should never interfere with the conscientious application of principles of treatment which have proven to be effective.

Paralysis cannot be prevented, but there is good evidence that its severity can be lessened by avoiding fatigue and chilling as soon as any suspicious symptoms of poliomyelitis occur.[22] Complete bed rest is the best treatment. Apparently mildly involved motor nerve cells can be made more vulnerable by overactivity. Although not a new idea, this fact deserves emphasis for it is one definite measure that should be enforced.

Significant paralysis is accompanied by muscle atrophy. In recent years the use of electrical stimulation has been renewed. By special technics muscle stimulation has been performed in both early and late cases. Some[23] have reported encouraging results in retarding the amount of atrophy. There is yet insufficient evidence to draw definite conclusions. However, the limitations are apparent in that the maintenance of mass in a muscle does not necessarily mean that the function will thereby be proportionately greater. Unless effective voluntary contraction can be restored, the paralyzed muscle remains a deficit regardless of the size of its fibers.

On the basis of the mechanisms we have considered, it will be apparent that treatment does not directly affect the fundamental lesion of

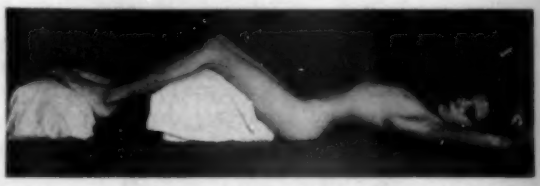

Figure 4. Patient in the sensitive phase of the convalescent stage. Painful, deforming attitudes of the hips and knees, equinus of the feet, and lumbar lordosis are minimized by careful positioning. Unless combatted by daily motion of the parts, fixed deformities result which will interfere with recovery.

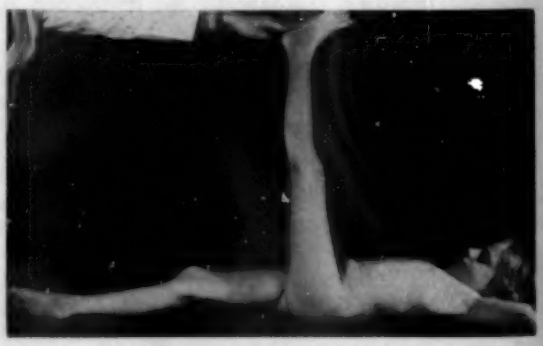

Figure 5. Same patient as above in the asensitive phase of the convalescent stage. The extremities are flexible and there are no permanent deformities. Despite significant paralysis the patient is able to stand and walk with the aid of braces. If the deformities had progressed, this would be impossible.

poliomyelitis, namely, paralysis. But, that is by no means an implication that the consequences of paralysis cannot be remedied. The ultimate goal is the restoration of adequate function of the involved parts. This, in turn, is influenced considerably by the changes we have discussed as secondary to the paralysis. Careful attention to positioning, the avoidance of inflexibility of the tissues, and the maintenance of normal ranges of joint motion will do much to facilitate the spontaneous recovery process (Figs. 4 and 5).

Remembering the sequence of changes in seriously paralyzed muscles, one can establish a sound basis for treatment. Passive motion of all joints should be started as soon as the destructive action of the virus presumably has ceased. For practical purposes this may be done starting forty-eight hours after the fever has subsided. The campaign against the development of contractures and deformities begins at once. It must be a constant vigilance with meticulous attention to all the forces operating to interfere with recovery of normal function. All factors must be evaluated according to their importance and appropriate measures should be included in the treatment program to combat deforming tendencies throughout all the stages of the disease. Only by this means can the greatest possible benefits be obtained from careful muscle reeducation, functional training, and surgical rehabilitation of the poliomyelitis patient.

Summary and Conclusions

The consequential symptoms of poliomyelitis depend upon the amount of destruction in various portions of the central nervous system and the degree of secondary changes in the musculoskeletal system resulting from paralysis.

The pathological sequences in the nervous system and involved extremities are described.

Some mechanisms underlying the symptoms of pain, muscle spasm, and paralysis are discussed.

The evolution of contractures and certain important factors in the production of deformities are summarized.

The process of recovery in incompletely paralyzed neuromusclar units is outlined.

The importance of combatting the secondary contractures and deformities in obtaining the maximal functional rehabilitation of the patient is emphasized.

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Interdepartmental Relations of Ancillary Medical Services:

With Special Reference to Physical Therapy

R. J. Stull

The general hospital of today is by necessity an institution which must be able to care for the medical needs of a wide variety of patients. Its operations must be geared to supply the facilities and personnel for the treatment of all types of cases. Persons of all ages and all classes seek its services. To meet the varied demands placed on its services, the hospital must have a coordinated scheme of operation into which each department fits like the pieces of a jigsaw puzzle. Also, it is necessary that there be a clear understanding between the various departments as to their definite responsibilities and functions and their relationship to other departments in the organizational pattern.

The physical therapy department is one of the members of a medical team working together to study and treat the patient in order that he or she may obtain maximum recovery and be able to resume the activities of normal living and work.

According to the American Physical Therapy Association, "Physical therapy includes the employment of the physical and other effective properties of ultraviolet and infra-red radiant energy, heat, cold, water, electricity, therapeutic exercise and massage in the treatment of disease and injury and for diagnostic tests." The use of these agencies and activities in patient care and the scope of service of the physical therapy department varies in different hospitals according to size of hospital, education and qualification of the medical staff, availability of professional personnel, the class and type of patient clientele served, and so forth. Consequently, it can be surmised that the diversity of relationships between physical therapy and the other medical and nonmedical services may differ in hospitals. Therefore, for this discussion let us not limit ourselves to any particular size hospital or to any individual physical therapy program, but simply review some of the regular hospital departments and activities and try to discover what relationships do exist.

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Read at Convention of Western Hospitals, Physical Therapy Section, May 1949.

1. *Administration and Business Office*

Monthly and yearly statistical reports to the administrator would be required to keep him informed of the volume and type of work performed. This acts to educate the administration as to the personnel requirements, the equipment and space needs of the department. In turn the administration can relate this information into budget appropriations which will permit adequate financing of a program meeting the demands for service.

Understanding of the rate schedules of the hospital and prompt handling of charge slips by the physical therapy department facilitates the operation of the business office and also keeps current the financial picture of the department which is essential for proper financing of its operation.

The physical therapist must be able to make a wise selection of equipment which means he or she must know relative values and choose what will be most satisfactory for a particular purpose. In this way, it eases the problem of purchasing by the administration and should promote cooperation in trying to meet the request.

Very important to the hospital administration, physical therapy means the physical handling of a large number of patients and thereby paves the way for claims of alleged negligence or mishandling. It is essential that the personnel of the physical therapy department understand the malpractice and liability insurance carried by the hospital and exercise due care at all times in the processing of patients. Likewise, because many of the cases treated involve rehabilitation of employed

workers there is a need for recognition of the various types of industrial insurance.

Generally speaking, the interdepartmental relationship here involves mainly the financial aspects of managing the department and the execution of functions set forth by administrative policy.

2. *Resident and Intern Staff*

The residents and interns in hospitals should spend some time in the physical therapy department learning something of physical medicine. Therefore, the department has a responsibility in postgraduate medical education.

In some hospitals, interns and residents take care of the employees' health; consequently, they are ordering treatment by physical therapy. This indicates the physical therapist should know the personnel health benefits of the hospital and be able to discuss these with the house staff in view of the treatment ordered.

The interns and residents serve as contacts in a great many instances between the physical therapy department and the attending physician, and, therefore, should be informed of the services available including the type of treatments and the conditions under which they can be given. This prevents many misunderstandings by the physician, useless treatments to patients and eliminates a lot of administrative difficulties. In addition, it can help to expedite requisitions for procedures.

The interns and residents often are charged with the responsibility for complete medical care to clinic or service cases and therefore consultation with the physical therapist assists greatly in the provision of proper and adequate treatment.

3. *Nursing Service*

The nursing service must know the needs of physical therapy and the reverse also is true. Because of the very fact of the patient being hospitalized, physical therapy must treat its in-patients between baths, meals, bed pans and visiting hours. The nursing staff can cooperate by completing the patient's routine care before treatment is to be given. The matter of making appointments with the floor supervisors or secretaries demands intelligent scheduling and prompt cooperation.

Nurses should be familiar with treatments in order to carry over essentials of body mechanics as applied to the particular patient and condition treated. Also in some instances the nursing staff is observing or assisting in treatments during the momentary absences of the physical therapist and in some hospitals they actually carry out treatment procedures. If the latter be the case then cooperation is necessary in assuring the availability of equipment and its return when the treatment is finished.

The nursing service, through its auxiliary personnel such as orderlies, ward aids, attendants, etc., is at times responsible for the transportation of patients to and from the physical therapy departments. This again means familiarity with treatments and patients' conditions for safety of transportation and adequate protection against exposure. Also, it implies the need for prompt service to prevent conflicts with the schedules of either of the departments involved.

Physical therapy has a responsibility in the education of student nurses. The student nurses should understand procedures, conditions of treatment, general principles and the use of general modalities if they are to be prepared for modern nursing and if later they are to be expected to cooperate with physical therapists in patient care.

4. *Medical Staff*

It often has been said that many physicians are not cognizant of the values or use of physical therapy procedures because they have been exposed to little or none of them during their medical training. There frequently is opportunity for physical therapists in the larger hospitals where medical students are present to explain and demonstrate and discuss technics of treatment. This should be an important part of the physical therapists' work. Also in larger hospitals, physicians in return often are called upon to teach student physical therapists.

In smaller communities the physical therapist in the general hospital may be the only qualified person in the area representing his or her profession. Much ground work in promoting the services of the department as part of the program for patient care is necessary and the success of the department may depend upon the ability of the physical therapist to acquaint medical men with the services available. There is a never-ending cycle of education of the medical staff in the use of the department through staff meetings, telephone conversations, inviting physicians in to see equipment and records and to discuss prescriptions for treatment, sponsoring a staff meeting on the subject of physical therapy, the lending of literature on new types of treatment, and so forth.

In addition to the use of the many general procedures for treatment and diagnosis of the physician's patients, the department is often requested to give patients instruction in standing, sitting, walking, and lifting in addition to an exercise program. These are aimed at preventing a recurrence of injury or chronic strain. The department

cooperates with the physician and directs the home programs of many patients. It also assists the physician in the care of his patient by written reports on the number of treatments, the type of treatment given and progress made.

Many more relationships between the physical therapists and the physician or the medical staff could be listed and discussed, but to summarize this relationship it is my opinion that physical therapy is now an accepted adjunct to the medical armamentarium for action against illness. Therefore, it is essential that coordination of effort in the treatment of the patient is mutually recognized by the physicians and physical therapists.

5. *Occupational Therapy*

A close relationship does and should exist between physical therapy and occupational therapy. In hospitals without occupational therapy, physical therapy is sometimes called upon to "pinch hit." In hospitals with long-term patients both departments often treat the same patients. Many times corrective physical therapy procedures for patients can be accomplished through occupational therapy which develops and maintains a healthy mental and physical tone and thus aids recovery and shortens convalescence.

6. *Brace Shop*

Because of the intimate relationship of the activities in the brace shop and physical therapy with the practice of orthopedic medicine there naturally occurs a close interdepartmental relationship.

It is often necessary that there be an exchange of information between those two departments in regard to the intended functioning of certain corrective pieces of apparatus. The physical therapists can assist in relating the ideas of the body mechanics which are to be produced by the finished product of the brace maker. At times it is important for the physical therapists to understand the mechanism of the apparatus in order to be able to remove it while other treatment is being carried out. Also the physical therapists can inform either the physician in charge or the brace shop direct by the permission of the physicians concerning progress of the patient indicating need for change in the apparatus.

This interdepartmental relationship, although in a great many instances involving a third party, the attending physician, obviously is quite necessary for effective patient treatment.

7. *The Social Service Department*

The social service department refers patients to the physical therapy department. In return when a request is necessary for reduced rates for the treatment or continuation of treatments on a patient, it is referred to the social service department for investigation and action.

One of the problems of the ambulatory services of the physical therapy department is the transportation of patients. Here is where social service can be of assistance by arranging with the Red Cross, other agencies and individuals for the needed transportation.

Social service also can work closely with physical therapy by securing finances for corrective apparatus needed, by establishing relationships with welfare agencies in an effort to improve home conditions that are not conducive to the progress of physical restoration, by making contacts with local hospitals and physicians in the area from which the patient might have been referred, by arranging for hospital admission and by many other such services.

8. *Personnel Department*

As is the case in every other department of the hospital, the personnel department activities are concerned with physical therapy. They must know something of the operation of the department and the functions of its personnel in order to set up proper job classifications and wage scales. The physical therapy department must abide by the personnel regulations and assist enforcement by supervising the activities of its employees. Also the department will often have to assist the personnel department in the securing of replacements or the filling of new positions by indicating possible sources, as the number of candidates are few.

Additional help can be given to the personnel department by participating in on-the-job training programs for nonprofessional personnel who need to be instructed in the handling of patients and by passing along information regarding the physical limitations of employees because of either temporary or permanent physical disabilities.

9. *Dietary Department*

Perhaps one would question any real relationships between physical therapy and the dietary department with the exception of the serving of an adequate diet to the employees of the department or to patients in the hospital under treatment. However, in some instances there is a real patient service relationship that involves not only physical therapy and dietary but perhaps occupational therapy. What I have in mind is instructing cerebral palsied children to eat by themselves. The type of food served can be quite an important factor in the early stages of the patient's instructions. There

are others such as diets for obesity which impede the patient's progress under treatment, timing of meal service prior to necessarily scheduled treatments, and so forth.

10. *X-ray and Laboratory Departments*

Diagnostic x-ray work is essential for the attending physician to discuss intelligently and plan with the physiatrist in charge of the department or the physical therapist, the required treatment schedule for many cases and thus again we have the need for the coordination of departmental activities.

The application of x-ray therapy and physical therapy (diathermy) in the treatment of arthritis necessitates proper timing of the treatments and demands careful scheduling.

The tests carried out by the laboratory department of the hospital indicating a diagnosis of tuberculosis, pregnancy, venereal disease, etc., must be available on the patient's record or through immediate telephone or personal contact in order to prevent the administration or continuation of therapy which could be harmful under such conditions. Observations by the physical therapist of abnormal conditions reported to the physician in charge may be helpful in determining the need for a particular laboratory or x-ray service.

11. *Medical Records and Medical Library*

The physical therapy department like all the other adjunct medical services must keep adequate and complete records. There are certain parts of the record which are for departmental use only, but others must become a part of the patient's hospital or clinic record. For example, the consultation sheet of the physiatrist would be included on the main patient record and all treatments preferably would be recorded in the hospital chart as well as progress and discharge notes.

The daily register of patients kept in the department can be used by the record room for a check on registered clinic visits or the volume of referred private ambulatory work. All departmental records would be helpful in compiling statistical information for teaching and research.

Record keeping in physical therapy is of great importance to its operations and should be processed in a manner permitting a close tie-in with the general record procedures of the hospital.

The number of publications relating to physical therapy has increased rapidly and being a new and changing field it is important that recent material is available for study. The physical therapist working in close cooperation with the medical librarian should see that current material is obtained and called to the attention of physicians on the staff. Advice can be given to postgraduate students on literature relating to special aspects of physical medicine and arrangements can be made for the library to set up a reserve shelf for material relating to certain assigned reading for student nurses and technicians. The physical therapist together with the librarian can do a great deal for education and research and promoting the advancement of physical therapy by acquainting the staff with recent developments in the field.

12. *Housekeeping Department*

The housekeeping department takes care of the cleanliness of the physical therapy department. Any interior decorating, flower arrangement, and other similar tasks are handled by housekeeping. In many instances linen is issued by this department and they should realize the needs of physical therapy.

Physical therapy is an area of the hospital where cleanliness must be maintained and continued housekeeping between patient treatments often is necessary to meet a schedule of procedures. Close working relationships between these two departments are a must.

13. *Maintenance Department*

The maintenance department is very important in the functioning of physical therapy. They repair equipment of all types, supply pool service, make physical renovations and other improvements to the department and are standing ready to handle emergency situations that might occur.

The physical therapist should know how to adapt and improvise equipment and be able to relate this information to the maintenance department. He or she should have intimate knowledge of the functioning of all the physical facilities fixed or movable in the physical therapy department and should observe carefully the operations of such facilities. In this way a schedule of preventive maintenance service can be arranged and demands for emergency assistance can be minimized. Also, the physical therapist must intelligently analyze the functional pattern of the area included in the department and be able to relate this into a program for the most effective utilization of space which can be achieved by physical changes accomplished through the services of the maintenance department.

14. *Out-Patient Department*

Ordinarily the greater percentage of patients treated in physical therapy are ambulatory outpatients, although this ratio will vary among hos-

pitals. A well organized schedule is an absolute necessity because out-patient visits must be scheduled advantageously so as to tie in with the programs of all the other out-patient services. In the out-patient department physical therapy's relationships with other areas of the hospital's services practically run the gamut of all the hospital departments previously mentioned.

15. *Pharmacy*

Physical therapy depends on the pharmacy for rubbing solutions, disinfectants and similar supplies. The physical therapist must be able to relate the needs for these items into terms which will permit the pharmacist to produce economically the supplies and at the same time develop improvements in the products used.

16. *Public Relations*

Not too many hospitals have public relations departments and some not even a public relations program; however, good public relations is one of the most important factors in the hospital community relationship. Obviously, in a department like physical therapy where there is so much intimate personal contact with both in-patients and out-patients there is a great opportunity for establishing proper relations with the public.

One of the greatest assets of a physical therapist is the facility of verbal expression which will enable him or her to secure the confidence and cooperation of the patient and at the same time depict the values of the service being rendered. A feeling of insecurity within the patient, no matter how unfounded, if improperly handled is fertile ground for sowing seeds of adverse criticism against the physical therapist and the hospital. A self-contained confident aura supplemented by a manner of speech which is appropriate both in tone and phrase will do much for promoting favorable public opinion to the department and to the hospital.

17. *Service to the Community*

Service to the community perhaps does not involve interdepartmental relations as intended for discussion under this topic, but it is one which is too important to neglect mentioning.

In many ways the physical therapy department has opportunities for service to the community which not only foster public appreciation and interest in the hospital and the department but contribute greatly toward meeting the total health needs of the area served. Let us look at some of them.

The department serves the community by answering questions and cooperating with such agencies and programs as the Red Cross, State Department of Rehabilitation, Crippled Children's Bureau, Cerebral Palsied Children's Program, Veteran's Administration, National Foundation for Infantile Paralysis, Welfare Department, local and state health departments and many others. An excellent example is the instruction of public health nurses in the treatment of poliomyelitis.

Working with civic groups in establishing physical therapy services is a fine way to carry out service to the community.

The physical therapists should know the various channels by which persons needing treatment may receive help and disseminate that information.

Certainly for this topic of discussion there are many interdepartmental relations within the hospital and areas of service to the community which have been omitted; some because of the lack of my acquaintanceship with them and others because they are so numerous and involve so much in the way of detailed operations that time would not permit their inclusion. My main purpose was to try, by relating some of the existing interrelationships, to emphasize that the department of physical therapy has the privilege of close contacts with other departmental personnel and with the physicians whose patients are treated. Therefore, the department is an important factor in the hospital and community health program and should cooperate and coordinate its activities accordingly. By its own efforts the department may improve its status and play a more vital part in attaining the ultimate goal we are all striving for—that of a more adequate total health program for the people of our country. It has been said that next to man's belief in God his health is the most important factor for his happiness and general well being. As physical therapists you have much to contribute.

Passive and Active Stretching of Muscles:

Spring Stretch and Control Group

Sonya Weber,* D.Sc., and Hans Kraus,† M.D.

General therapeutic exercises are prescribed for their systemic effects; specific therapeutic exercises are prescribed to improve "clinical muscle qualities." These qualities are muscle power, muscle elasticity (muscle length) and coordination.[1, 2]

Muscle power is the ability of a muscle to contract and produce work.

Total muscle elasticity is the ability of a muscle to give up contraction and assume its maximum length. Total muscle elasticity consists of two components; namely, the "physiological elasticity" which enables the muscle to relax and actively give up contraction, and the "mechanical elasticity" which is the inherent physical elasticity, comparable in its action to the compression and extension of a coil spring. Total elasticity is the combination of both the physiological and the mechanical elasticity.

Coordination is the interaction of the nervous system with muscle groups in synchronizing contraction of the protagonist and decontraction of the antagonist muscles.

Accordingly, specific therapeutic exercises may be given to improve any one or all three basic functions of the skeletal muscles and are prescribed to suit individual needs.[2]

Normal body function demands not only power and total elasticity in all muscles but both these qualities must be perfectly balanced in protagonist and antagonist muscle groups. If this balance is impaired, the muscle performance, the range of joint motion, the posture or the coordination may be affected, or a combination of these may be involved.

Almost any case in physical medicine where therapeutic exercises are indicated poses the problem of increasing the elasticity in some muscle groups.

This paper deals only with methods of exercising foreshortened muscles to increase their elasticity or muscle length.

Impairment of muscle elasticity may develop in a "normal" muscle. The length of a muscle will be permanently reduced if it is held repeatedly and over long periods of time over a shorter distance than the distance from origin to insertion.[3] This may occur actively if a person assumes such a position by habit or occupation—or passively by means of splints or supports. The result is a "contracture."

A contracted or foreshortened muscle has a diminished mechanical elasticity. Such a condition, if persistent, may cause fibrous changes in the muscle. If a muscle is worked beyond fatigue and pain limit, it may react with muscle spasm which ultimately also may lead to contracture.

The high incidence of shortened back-hamstring-gastro-soleus muscle groups without any pathology in young boys and girls is discussed by Gurewitch and O'Neill.[4] In examining 513 children (ages 4–18 years) they found 147, or 34 per cent, could not touch the floor with their fingertips with the knees straight in the test for elasticity of back-hamstring-gastro-soleus muscle groups. In straight leg raising to 90 degrees or better, testing the elasticity of the hamstring muscles, 64 per cent were found to have foreshortened left and 63 per cent foreshortened right hamstring muscles.

In the report on 1,000 cases examined at the Low Back Clinic of Presbyterian Hospital, Columbia Medical Center, Dr. Barbara Simpson reported 59 per cent to be at least partly caused by postural defects, which means an imbalance between muscle groups—namely, foreshortened muscles with weakened antagonists.

In 143 low back cases, Kraus[5] found that 92 (65 per cent) were cases of muscular imbalance, i.e., postural cases. One hundred one cases (71 per cent) had foreshortened back-hamstring-gastro-soleus muscle groups. The angle indicative of ham-

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string muscle length was taken in 106 of these cases. Of these, 46 cases (41 per cent) had foreshortened hamstring muscles.

The physiological law that a muscle held in foreshortened position over long periods of time will shorten permanently explains why muscle contractures occur so frequently even without pathology. The sitting position at desks or worktables tends to shorten hamstring and iliopsoas muscle groups. In treating postural deviations, the stretching of these foreshortened muscles poses a major problem.

Attempting to regain the normal total elasticity of muscles, two methods of exercising are used: The "spring stretch" or bobbing, and the plain active and passive stretch.

There is a justifiable difference of opinion as to the value of these two muscle stretching methods. The spring stretch may be dangerous in conditions with pain and muscle spasm as there is greater possibility of provoking increased pain with subsequent limitation of motion and increased muscle spasm. In all such cases, for instance, as acutely painful low back strains, this danger must be kept in mind.

On the other hand the large group of patients with imbalance of muscle power and elasticity, but no pathologies, i.e., purely postural defects as well as postpoliomyelitic patients not limited by pain or spasm, can be treated with the spring stretch method.

CASES OBSERVED

All cases in this experiment were referred to the Posture and Corrective Exercise Clinic by the Babies Hospital Out-Patient Department. The ages ranged from 6 to 12 years with an average of 8½ years. Only general poor posture cases and old postpoliomyelitis cases with a rating of "normal" in all muscles on the poliomyelitis muscle testing charts were accepted in these groups. All patients had undergone a complete pediatric examination. None of these patients suffered from pain or spasm.

All of them showed definite shortness of hamstring muscles. The angle indicative of the hamstring muscle length ranged from 18 to 2 degrees below the normal 30 degree angle in both groups. In the group treated with spring stretch, the back-hamstring-gastro-soleus muscle length ranged from 11 to 0 inches distance from fingertips to floor; in the control group, 14 to 0 inches, fingertips to floor. Otherwise they were unselected cases.

In both groups the identical exercise program and same dosage (amount of movement) as well as the same amount of hospital visits and "homework" were prescribed. The "homework," consisting of exercises done at home, is an unavoidable "variable" which could be controlled only by hospitalization of the patient. It may be assumed that in 50 unselected cases this "variable" would be fairly equal in the two groups.

TESTS AND MEASUREMENTS

The following tests for muscle length and elasticity were used.

A. *The elasticity of hamstring muscle group* was measured by the angle to which the legs could be lifted from the supine position without causing a motion in the lumbar region of the spine.

To take this measurement the patient must be completely relaxed in a supine position on the examination table. A protractor is placed with the straight line of 0–180 degrees on the table close to the patient's hip joint. The examiner places his fingers lightly on the posterior spinal processes of the 4th and 5th lumbar vertebrae, sliding his hand gently under the patient's back. An assistant slowly lifts both the patient's legs, holding them at the ankles. The patient must remain completely relaxed during the entire procedure. The instant the examiner feels downward motion in the lumbar spine, the full length of the hamstrings has been reached and a further lifting of the legs causes only a compensatory movement of the lumbar vertebrae in a posterior direction. When this motion of the lumbar vertebrae is felt by the examiner the assistant stops lifting and holds the lifted legs until the arm of the protractor is adjusted parallel to the length axis of the femur and the acute angle between table level 0–180 degrees and the femur is read off the protractor. Thirty or 30+ degrees is considered normal.[6] In the following tabulation this angle is referred to as Θ.

B. *The total elasticity of erector spinae-hamstring-gastro-soleus muscle group* was measured by the distance from fingertips to floor. The patient is asked to bend forward and to touch the floor with the fingertips of both hands. Care must be taken that the knees remain straight. The distance from the floor to the fingertips is measured with a ruler. Touching the floor is considered normal. In the following tabulation this distance is referred to as L.

TREATMENT METHODS

1. *The spring stretch method* applied in the first group was used as active and passive stretch.

The *passive* spring stretch of hamstring muscles could be described as a "bobbing" motion induced by the physical therapist at the point where he (or she) feels that the muscle has reached its fullest

extension or length. For example, the patient is supine on the table; the physical therapist holds one leg with the right arm so that the leg with straight knee lies cradled on the physical therapist's forearm. The left hand and forearm of the physical therapist rests across the patient's pelvis to hold it steady. The leg is raised as far as the length of the hamstring muscles permits and then a slight swinging or bobbing motion exerting pressure to raise the leg further is rhythmically applied.

The *active* spring stretch is given with the patient standing erect, knees straight, bending over to touch the floor with fingertips. When he has bent over as far as possible, he "bobs" up and down with a spring-like motion, exerting power in the downward direction, thus decreasing the distance from fingertips to the floor.

2. *The plain stretch* applied to the second group also was used as passive and active exercise. The same exercises were used, but *without* the bobbing or spring-like rhythmical motion.

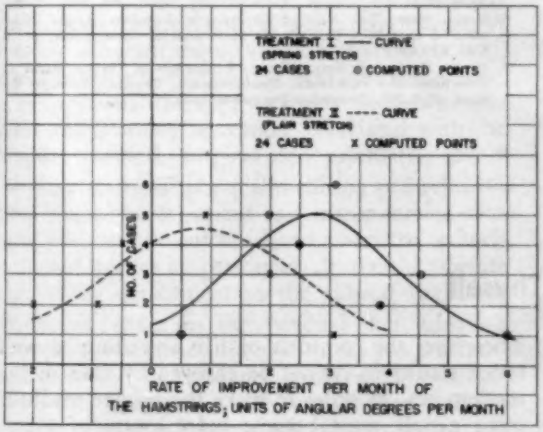
TREATMENT I —— CURVE
(SPRING STRETCH)
24 CASES ⊙ COMPUTED POINTS
TREATMENT II ----- CURVE
(PLAIN STRETCH)
24 CASES x COMPUTED POINTS
NO. OF CASES
RATE OF IMPROVEMENT PER MONTH OF
THE HAMSTRINGS, UNITS OF ANGULAR DEGREES PER MONTH

Chart I—Hamstring muscle length.

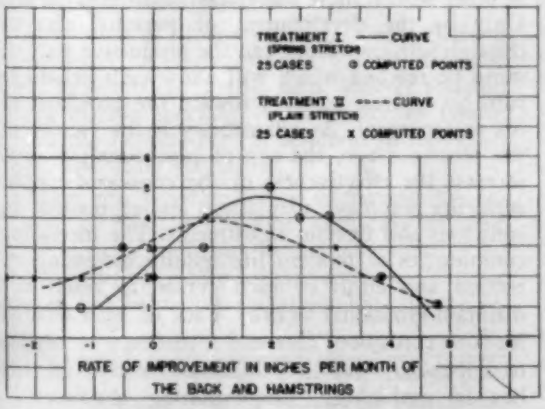
TREATMENT I —— CURVE
(SPRING STRETCH)
25 CASES ⊙ COMPUTED POINTS
TREATMENT II ----- CURVE
(PLAIN STRETCH)
25 CASES x COMPUTED POINTS
RATE OF IMPROVEMENT IN INCHES PER MONTH OF
THE BACK AND HAMSTRINGS

Chart II—Hamstring-back-gastro-soleus muscle length.

In the *passive* stretch, the physical therapist raises the leg of the patient as far as possible, using slight but steady pressure, holding the position for a few seconds before lowering the leg.

In the *active* stretch, the patient bends over as far as possible, holds the position for a few seconds and returns to the upright position.

The most effective presentation of such data is graphical in form. In this particular case, a Frequency Table was formed by placing the datum (rate of improvement) of individual cases into groups. The Frequency Table is presented graphically in Charts I and II. The smooth curve represents the best average of the computed points. The peaks in the respective curves clearly differentiate between the results obtained by the two methods of treatment under consideration.

Similar results are obtained by simply finding the arithmetic mean of all the cases considered. The following example will clarify the manner in which each case was treated to determine the rate of improvement.

Case 12		*Treatment 1*	
Before treatment $\theta_1 = 26°$	(Angle indicating shortened hamstring length)	$L_1 = 3\frac{1}{2}''$	(Inches from fingertip to floor, indicating shortness of back and hamstrings)
After treatment $\theta_2 = 32°$	(Angle indicating normal hamstring length)	$L_2 = 0''$	(Fingertips touch the floor, indicating normal back and hamstrings)

The treatment time T of 2 months in this case, gives then a rate of improvement of hamstring muscle length as follows:

$$\text{Hamstring: } \frac{\theta_2 - \theta_1}{T} = \frac{32 - 26}{2} = 3.0° \text{ improvement per month}$$

The rate of improvement per month for the back and hamstrings are computed in an analogous manner.

The final results obtained by finding the arithmetic mean of the rate of improvement of all cases considered are given in the following table:

Treatment I Spring Stretch		Treatment II Plain Stretch	
Hamstrings	Back and Hamstrings	Hamstrings	Back and Hamstrings
$\Delta_{\theta/T}$	$\Delta_{L/T}$	$\Delta_{\theta/T}$	$\Delta_{L/T}$
3.0° per month	2.0 in. per month	1.0° per month	1.0 in. per month

One will note the close correlation in results indicated by the arithmetic mean method and peaks obtained by the graphic analysis.*

*Computations and graphic representation by H. Nelson of Microwave Research Institute of Polytechnic Institute of Brooklyn.

Since the number of cases is small, further investigation would be indicated. The results would be insignificant if the difference in rate of improvement per month found in these two groups of patients were small. Actually, the improvements per month in cases treated with spring stretch is 200 per cent greater in stretching the hamstring muscles and 100 per cent greater in stretching the combined back-hamstring-gastro-soleus muscle groups, than in the control group given the plain passive and active stretch.

If these findings are confirmed by further investigation, the use of the "spring stretch" method would cut the treatment time to one-third in stretching hamstring muscles and to one-half in stretching the combined muscle groups of back-hamstring-gastro-soleus muscles.

SUMMARY

The paper reports on results of treatment in patients with foreshortened hamstring and back-hamstring-gastro-soleus muscle groups. The rate of improvement per month in regaining normal length of these muscle groups was computed in 50 unselected cases. The technic of measurements and treatment methods are described. In 25 cases the "spring stretch" method was applied. In the control group of 25 cases, the "plain stretch" method was applied.

The spring stretch method showed an average improvement of 3.0 degrees in the hamstring muscles and 2.0 inches in the back-hamstring-gastro-soleus muscle stretch per month.

In the "plain stretch" the average improvement per month was 1.0 degrees and 1.0 inch improvement per month respectively.

According to these findings, the "spring stretch" method showed 200 per cent more efficiency in the hamstring muscle and 100 per cent more efficiency in the back-hamstring-gastro-soleus muscle stretch.

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Know Thyself

Recently Franz Alexander,[1] writing on "Emotional Maturity," emphasized that the Greek maxim "Know thyself" may once have been a luxury but has today become a necessity. If the world and the individual were both stable the application of fixed automatic patterns could insure harmonious adaptation to conditions. Adults who live under extremely stable conditions would not need the great ability in flexible adaptation necessary in a rapidly changing environment. In the feudal period in Europe when conditions and customs remained the same from generation to generation and the place of each person was rigidly determined by society, the same behavior patterns handed down from parent to child provided for sufficient adaptability. However, in the present industrial era rapid social change, which has been described as the most conspicuous feature of present times, requires that each person make several rapid readjustments to changing material and ideologic situations. Therefore, the comforts of life according to well tested traditions cannot be enjoyed by man in the modern era. In order to make the proper readjustment people must become more aware of themselves, their desires, impulses, motives and needs; in other words, more self-reliant and more mature. Only by the development of personal security through self-knowledge can the productive state of mind be reached which will allow each person to turn his interest outward toward the problems of his environment. As adaptability is the faculty of the conscious ego, the aim of psychoanalysis is to increase the effectiveness of the conscious ego by replacing automatic adaptations and repressions by conscious and flexible adjustments. The increasing complexities of modern life require increasing attention and effort by each person to reach and maintain emotional security. Lack of such security leads to confusion, fear and a tendency to regress to dependent ways of childhood, where security lies in unthinking, unquestioning obedience.—*From J.A.M.A., 139:17:1151, April 23, 1949.*

1. Alexander, F.: Emotional Maturity. Ment. Health Bulletin 26:1-4 Nov.-Dec. 1948.

Physical Medicine and Rehabilitation

The Council on Medical Education and Hospitals has recently revised the Essentials for residency training in Physical Medicine and Rehabilitation. Hospitals conducting residencies limited to training in Physical Medicine are advised to expand their programs to meet the requirements of the broader concept of this specialty. A copy of the new Essentials as ratified by the House of Delegates June 6, 1949, follows:

Residencies in this specialty should include experience in the various aspects of rehabilitation and training in the clinical and diagnostic use of all physical agents except those employed in radiology. As used in these essentials, rehabilitative medicine is considered to be that phase of medicine which is concerned with the care, treatment and restoration of the physically and psychiatrically handicapped patient and of the convalescent. A complete program should include physical therapy, corrective speech, psychologic services, social service, occupational therapy, vocational guidance, education and planned recreation, correlated with the necessary medical, surgical and psychiatric care.*

A department of physical medicine and rehabilitation should be organized as a major service with a qualified department head and associates, as well as trained technical personnel. It should operate as a service department to the clinical divisions.

Sufficient space in the hospital and adequate equipment should be provided to carry out a comprehensive and well planned program. The allocation to this service of a sufficient number of beds, as well as treatment rooms, offices, class rooms and space for recreation and other activities, is highly advantageous, if not essential.

A minimum of three years of residency training is considered necessary to train a physician who desires to specialize in this field. Shorter training periods in this specialty of from six to twelve months may be valuable for residents in medicine, surgery and other specialties.

A three year program should encompass the entire field of physical medicine, including its basic science aspects: medicine, in the rehabilitative aspects of arthritic, cardiovascular and other chronic diseases; ophthalmology-otolaryngology, in the rehabilitation of the blind, deaf and otherwise handicapped patient; psychiatry, as it applies to the care and treatment of the convalescent medical and surgical patient and the psychoneurotic patient; neurology, particularly in its application to special problems such as hemiplegia and other chronic neurologic disorders; orthopedics, as it applies to congenital and acquired deformities; surgery, as it applies to traumatic, amputee and plastic cases; and pediatrics in its relation to the poliomyelitic, rheumatic, cerebral palsied and similar patients. Theoretical and practical training should be given in the use of braces and prosthetic appliances, special technics and equipment for the evaluation, diagnosis and treatment of the physically and mentally handicapped. Psychosocial and prevocational rehabilitation of the convalescent and chronically ill patient should be an integral part of the program. In those cases where the out-patient activity is limited, affiliation with other institutions offering training in special aspects of this field is indicated.

Quantitative Requirements

To supply an adequate amount and variety of teaching material, there should be a minimum of 500 admissions and 7,500 patient visits to the department annually.

Applied Basic Science Instruction

Training at the graduate level in anatomy, physiology, physics, biophysics and pathology is considered essential. The training in anatomy should include functional anatomy and kinesiology. The training in physics should include radiation physics, electronics and instrumentation. Study in applied basic sciences should be closely correlated with clinical experience.

Board Requirements

The American Board of Physical Medicine requires candidates for the certifying examination to have completed an approved rotating internship, following graduation from a medical school approved by the Council on Medical Education and Hospitals, a period of study after the internship of not less than three years of approved supervised training and not less than two additional years of study and/or practice in this specialty.

*Programs presently limited to training in physical medicine should be expanded to meet the requirements of the broader concept of this specialty.

Reprinted from Council on Medical Education and Hospitals' Section, J.A.M.A., 140:10:909, July 9, 1949.

The Board requires that the special training following the internship include a period of study in clinics, dispensaries or hospitals recognized by the Council on Medical Education and Hospitals and by the American Board of Physical Medicine as competent to provide a satisfactory training in physical medicine and rehabilitation. During this period, the resident should be assigned directly to the department of physical medicine and rehabilitation for a minimum of one and one half years. The period of specialized preparation should include (*a*) graduate training in anatomy, including kinesiology and functional anatomy; physics, including radiation physics, electronics and medical instrumentation; physiology; pathology, and other basic sciences which are necessary to the proper understanding of the specialty; (*b*) an active experience of not less than two years in hospitals, clinics or dispensaries approved by the Council and the American Board of Physical Medicine. An additional period of not less than two years of study and/or practice in the specialty is considered necessary to complete the applicant's training. The candidate is required to pass a written and oral examination given by the Board, which will include questions concerning the basic sciences, clinical practice and laboratory and public health problems related to physical medicine and rehabilitation.

Sir William Osler—Centenary Anniversary

The greatness of William Osler as a physician was a reflection of his broad approach to medicine and to life. He was outstanding in clinical and scientific medicine, but his greatness resided in his recognition of the importance of the Art of Medicine, which was exemplified in its highest form in contacts with patients and colleagues. Kindliness, a warm personal interest and an all-pervading recognition of the value of the individual were characteristic of Osler in his social and professional life. In "Aequanimitas" Osler expressed his personal belief in the qualities of mind and soul that enable a man to rise superior to the trials of life and meet difficulty, success and sorrow with serenity. The "Principles and Practice of Medicine," written in masterful English prose, was promptly recognized as a masterpiece. Through accuracy of clinical perception coupled with lucidity of expression, his inspiration permeated clinical medical practice. This textbook and its many successive editions tremendously influenced several generations of medical thinking in the English speaking world.

Osler's approach to life and his ability as a clinician, a teacher and a leader of men are well and fully presented. His tremendous influence on medical thinking is described in his accomplishments in Canada, in Philadelphia, at Johns Hopkins and at Oxford. Comments of these men who knew Osler best are replete with the sincerest expressions of warm friendliness and respect. The late Fielding Garrison wrote of Osler, "Every gift of the gods was his—he is one of nature's chosen. It is almost thirty years since he died, and his eminence as a teacher and physician has not waned, indeed the years have added to his glory. No one has in any way taken his place as the young physician's friend and as the world's best doctor."

For these and other qualities on this hundredth anniversary of his birth, Dr. William Osler must be reverently remembered as a great physician, an inspiring teacher and a friend of man.—*From Editorials, J.A.M.A., 140:13:1098, July 30, 1949.*

SCHOOLS APPROVED FOR TRAINING PHYSICAL THERAPISTS

By Council on Medical Education and Hospitals of the American Medical Association

Name and Location of School	Medical Director	Technical Director	Entrance Requirements[a]	Length in Months	Classes Start	Tuition	Certificate, Degree, Diploma
CALIFORNIA							
Children's Hospital, Los Angeles	Samuel S. Mathews	Sarah S. Rogers	a-b-d	14	Sept	$300	Cert. or Degree
College of Med. Evangelists, Los Angeles[1]	F. B. Moor	R. Wm. Berdan	a-b-c-d	12	Sept	$225	Cert. or Degree
Univ. of So. California, Los Angeles	Charles L. Lowman	Charlotte W. Anderson	a-b-d[2]	12	Sept	$496	Cert. or Degree
Univ. of California Med. School, San Francisco[1]	Lucile M. Eising	Margery Wagner	d-e	12	Sept	$220[4]	Cert. or Degree
Stanford Univ., Stanford[1] (Palo Alto)	Wm. Northway	Lucille Daniels	a-b-d[2]	12	Jan June	$523.30	Cert. or Degree
Permanente Hospital, Oakland and Vallejo[1]	O. L. Huddleston	Dorothy Hoag	a-b-d	12	July	$200	Cert.
COLORADO							
Univ. of Colorado Med. Center, Denver	Harold Dinken	Mary Lawrence	a-b-d	12	Sept	$300	Cert. or Degree
ILLINOIS							
Northwestern Univ. Med. School, Chicago	John S. Coulter	Gertrude Beard	a-b-d	12	Oct	$450	Cert.
IOWA							
Univ. of Iowa Med. School, Iowa City	W. D. Paul	Olive C. Farr	e	12	Sept	$200	Cert.
KANSAS							
Univ. of Kansas School of Med., Kansas City	Donald L. Rose	Lilyan G. Warner & Ruth Monteith	a-b-c[3]	12	Feb Sept	$80[4]	Cert. or Degree
MASSACHUSETTS							
Bouve-Boston School of Phys. Educ., Boston	Howard Moore	Constance K. Greene	H.S.	36	Sept	$500 yr.	Degree
Simmons College, Boston	Wm. T. Green / Arthur L. Watkins	Janet B. Merrill	a-b-d	16-36	Sept	$550	Cert. or Degree
Boston Univ. College of Phys. Educ. for Women: Sargent College, Cambridge 38	Kenneth Christophe	Adelaide McGarrett	H.S.	36	Sept	$435 yr.	Cert. or Degree
MINNESOTA							
Univ. of Minnesota, Minneapolis[1]	Miland E. Knapp	Ruby M. Green	H.S.	36	Oct	$530[4]	Degree
Mayo Clinic, Rochester	Earl C. Elkins	Helen Belknap	a-b-c	12	Sept	None	Cert.
MISSOURI							
Washington Univ. School of Medicine, Barnes Hospital, St. Louis[1]	Sedgwick Mead	Beatrice F. Schulz	e	2 yrs	Sept	$400 yr.[6]	Degree
St. Louis Univ. School of Nursing, St. Louis[1]	A. J. Kotkis	Sr. Mary Imelda	H.S.	36	Jan Sept	$300	Degree
NEW YORK							
Albany Hospital, Albany	John W. Ghormley	Catherine Graham	a-b-d	12	Sept	$250	Cert.
Columbia Univ., New York City[1]	Wm. B. Snow	Floy Pinkerton	a-b-c	1 or 2 yrs	Sept	$450 yr.	Cert. or Degree
New York Univ. School of Education, New York City[1]	George G. Deaver	Elizabeth C. Addoms	a-b-d	12	Sept	$589	Cert. or Degree
NORTH CAROLINA							
Duke Univ. School of Med., Durham[1]	Lenox Baker	Helen Kaiser	a-b-d	15	Oct	$300	Cert.
OHIO							
Cleveland Clinic, Cleveland	S. G. Gamble	Anna Wetterhuus	a-b-d	12	Jan	$200	Cert.
PENNSYLVANIA							
D. T. Watson School of Physical Therapy, Leetsdale[1]	Jessie Wright	Kathryn Kelley	a-b-d	12	Oct	$300	Diploma
Graduate Hospital, Univ. of Pa., Philadelphia[1]	George M. Piersol	Dorothy Baethke	a-b-e	12	Sept	$300	Cert.
TEXAS							
Hermann Hospital School of Physical Therapy, Houston	Oscar O. Selke, Jr.	Mary Elizabeth Kolb	a-b-d	12	Oct	$300	Cert. or Degree
Univ. of Texas School of Med., Galveston	G. W. N. Eggers	Ruby Decker	a-b-d	12	Jan	$163[4]	Cert.
VIRGINIA							
Baruch Center of Physical Medicine of Med. College of Virginia, Richmond[1]	Walter J. Lee	Susanne Hirt	a-b-c[5]	12	Sept	$351[4]	Cert. or Degree
WISCONSIN							
Univ. of Wisconsin Med. School, Madison[1]	Harry D. Bouman	Margaret Kohli	a-b-c[5]	12	Sept	$150[4]	Cert. or Degree
MEDICAL DEPARTMENT—U. S. ARMY							
(a) Medical Field Service School, Brooke Army Medical Center, San Antonio, Texas, and	James E. Tate Lt. Col., M.C.	Ethel M. Theilmann, Major, WMSC	f	12[7]	Nov	None	Cert.
(b) Fitzsimons General Hospital, Denver, Colorado, or	H. B. Luscombe Colonel, M.C.	Elsie Kuraner, Major, WMSC	Completion of Medical Field Service School.				
(c) Walter Reed General Hospital, Army Medical Center, Washington, D. C.	Emmett M. Smith Colonel, M.C.	Barbara Robertson, Captain, WMSC	Completion of Medical Field Service School.				

[a]Courses are so arranged that any of the entrance requirements will qualify students for training. a = Graduation from accredited school of nursing; b = Graduation from accredited school of physical education; c = Two years of college with science courses; d = Three years of college with science courses; e = Baccalaureate degree; f = Baccalaureate degree with major in physical education or the biological sciences. H.S. = High school graduation.

[1]Male students are admitted.

[2]High school graduates accepted for a four-year course leading to A.B. degree.

[3]High school graduates accepted for four-year college course.

[4]Nonresidents charged additional fee.

[5]Certificate granted by Children's Hospital Society; degree granted by University of California at Los Angeles.

[6]Tuition reduced second semester of second year.

[7]12 months includes training at the Medical Field Service School and Fitzsimons or Walter Reed General Hospitals.

Editorials

Employment for the Handicapped

One of the most vital problems in the complete rehabilitation of patients who have suffered crippling or disabling diseases or injuries is placement in satisfactory employment. Adequate treatment includes rehabilitation from the physical, psychological, social and economic standpoints, until the patient becomes self-sufficient. Each factor is dependent upon the other factors and frequently the whole treatment fails because of the failure to find a solution to the social and economic problems which confront the patient when he returns to his former environment.

In an ideal situation, a person trained in the field of medical social work is the logical one to give assistance with the problems of readjustment. But too often there is no one specifically responsible for that type of aid. If the physical therapist is really interested in the welfare of his patient and does not want to lose the results of his physical care, he must assume all or part of the responsibility for helping the patient with his problems. It is expedient, therefore, to become acquainted with the various agencies which give assistance in vocational guidance and training and employment. In most urban communities there are many such agencies and one may always seek the aid of the federal government through the Federal Security Agency.

It has been established that production of handicapped persons is equal to that of unimpaired workers and that in many cases the handicapped individual is peculiarly adapted to certain types of work. There has been considerable publicity pointing out the advantages of employing handicapped persons.

There is still much that can be done to educate the general public to this idea and we can each do our part as individuals to promote the practice. As physical therapists we must first help the patient develop the ability to engage in some lucrative activity, then assist him in making the necessary contacts to obtain such employment. Until this final step in his rehabilitation is made, his reestablishment to an active, useful person is incomplete. We must recognize this wider scope of our responsibilities as physical therapists and assist in every way possible to provide economic security for the handicapped. When they become self-supporting, tax-paying citizens, the economic welfare of the entire community is improved.

Association Activities

New Officers and Director

At the Annual Meeting of the House of Delegates, Marguerite Irvine was promoted to the office of President of the Association, due to the resignation of Lois Ransom from this position. Harriet Lee was then elected as Vice-President to complete Miss Irvine's term of office, and Louise Bailey was elected as Director to complete the vacancy left by the death of Mr. Henshaw.

Address by Mary McMillan

(Given at the Opening Session of the 26th Annual Conference, American Physical Therapy Association, Boston, Mass., June 1949)

I have been asked to extend, from the Massachusetts Physical Therapy Association, a welcome to you all and greetings. Now, you seem to have had quite a welcome, and I think that the welcomes and the greetings seem to come from the

Mary "Macs"—the young and the old Mary "Macs" are here to extend, to carry greetings from the Massachusetts Chapter to all of you visiting Boston.

I remember some time ago a friend of mine said he was asked if he would be toastmaster at a certain gathering, and he said modestly, oh, he didn't think he had the know-how to be able to be toastmaster.

His friend said, "Oh, really, it's very simple. All you have to do is make your remarks so dull and uninteresting that all the other speakers will shine in comparison." And then he added, "And I think you are very well suited."

I feel exactly like that toastmaster—so you can all shine in comparison.

I remember very well the first convention that Miss Ransom spoke of. There was just a handful of us here. I was asked tonight how many, and I really do not dare say. Maybe some of you that are here could say more accurately, but let us call it just a handful. That is a kind of easy way to get out of it.

I understand that today there are between three and four thousand members, and at the peak there were some 1600 Army officers; PT officers and not civilian employees, if you please, but Army officers with military status. Now, that just did not happen; those things do not just happen.

Perhaps some recently graduated PT may say, "Well, I don't know why I should join the American Physical Therapy Association. What do I get out of it?"

I would like to answer that question, if I may.

Had it not been for the American Physical Therapy Association, you would not be a professional woman today, with any standing whatsoever. You merely would be someone who took a course for a few weeks or a few months. If your profession means anything to you it is because the American Physical Therapy Association has put into your Association the things that made it count in the professional world.

The early members of your Association—and I know there are quite a few here tonight who attended that early convention, the first one in Boston, twenty-eight years ago—they did not join and say, "What can I get out of it?" They said, "I intend to join to see what I can make of my profession, to see what I can do to create standards and to maintain standards."

You know that is what it all amounts to because progress is a relay race—one generation passes on to the next. And I think there is a saying in a certain book which we all have been taught to revere, that tells us just about that thing. In other words, it is what we put into a thing that we get out of it.

And I would like to say to our younger members who are just beginning their lifework, go into it. It is not a static thing; no, not at all. It grew from a handful to four thousand. Oh, yes, there have been twenty-eight hard years and hard work for lots of people, and I am sure there is not one that has put hard work into it that does not feel a tremendous reward.

Now go in; keep your torch lighted; pass on something tangible and intangible to the next generation. It is not because you give; it is simply the law that if you give and give of yourself, you get a great deal out of it.

I am here to extend greetings and more greetings to you all, and I hope you may have an inspiring week, an interesting week, a worthwhile week—perhaps we can have the steam turned off. We don't always have it turned on this time of year. And I do hope you have just a grand time in the convention and out of the convention.

Hearty greetings to you one and all from the Massachusetts Physical Therapy Association!

* * *

At the conference banquet Miss McMillan also delivered the following remarks:

Regarding the honor you pay me, it is far, far beyond my deserts.

I am sure many of you have experienced at some time something which so touched your emotions that you found words of thanks or acknowledgment impossible. Well! That is what you did to me Sunday evening.

Dr. Howard Rusk's words of praise regarding my contribution to the American Physical Therapy Association humbled me greatly, but when the 700 present rose to their feet, I was so moved, so overwhelmed by it all, that I had to steel myself against a word even of thanks or of appreciation.

No, friends, it is not to me that credit or honor is due for the growth and development of the Association. It is to the chapter presidents, past and present, the national officers, past and present, who meet at convention and other times from early morning until late in the evening to help iron our problems. It is to your directors, standing committees, advisory committee, it is to the years of devoted service of the executive secretary and the educational secretary, to those in the Army who throughout the years have fought and won military status for Army physical therapists, it is to those who for years gave of their time and talents to make THE PHYSICAL THERAPY REVIEW a success. It is to all these that I would like to do honor.

The National Association has given to me so much, you have enriched my life exceedingly and made me very happy. I thank you from my heart.

Polio Epidemic News

You are all aware the polio season is here again, but do you know that the incidence is running high—higher than last year which was the second largest epidemic according to the figures of the Public Health Service. For the week ending July 23, 6,339 cases were reported. The conclusion is obvious. Additional personnel is needed in all the fields represented in the care of the polio patient. To us it means that physical therapists are needed.

The American Physical Therapy Association is the official recruiting agency for physical therapists. This is a duty, a challenge and a problem. There is no pool of available physical therapists, and much as we would like to we cannot fill the requests coming into the National Office.

Requests are therefore being channeled back to the local areas—to the American Physical Therapy Association Chapters. That does seem to be the logical place to find a physical therapist for emergency work. Chapters have been contacted by the National Office, and the situation explained to them. This is an appeal to you. Who do you know who might be approached concerning the need? Perhaps it is an inactive member who would gladly take on this temporary work. It might even be someone who has let his or her membership lapse. Such work need not necessarily be full time. We all know how much we would welcome a few hours' help by another physical therapist when our schedule is full.

Stop for a moment and see if you cannot think of someone. Talk to your friends. A mutual effort might be more rewarding.

Remember that there are patients who need treatment. Perhaps you yourself could accept a temporary assignment in or out of your state. If you can help your Association to fulfill its obligation, please contact your local chapter officers or write directly to the National Office.

It's *our* job, which means it's *yours*.

Procedures for the Nominating Committee

Article X, Section 13, states the duties of the Nominating Committee as follows:

I. Prepare a list of nominees from those consenting to serve, if elected, for officers and directors of the Association and for two members of the Committee on Nominations, said list to be balloted on at the elections held on even-numbered years.

A. The completed forms are to be forwarded to the Chairman of the Nominating Committee, in care of the National Office, no later than November 15 in order that the Committee may have sufficient time to obtain further information about the candidate from the membership file in the National Office or from any other available sources.

Five copies then will be made for the Chairman to distribute to the committee members. Any briefs from the membership file also can be made up (5 copies) as requested.

In filling out the form all names should be submitted for specific offices with justification for such selections. (The Nominating Committee may at its discretion nominate a candidate for an office other than the one suggested if in their opinion the individual is better or equally qualified for that office.)

II. To facilitate the work of the Nominating Committee and to provide you with an opportunity to assist in the choice of nominees for the Executive Committee, a blank has been prepared. In selecting candidates, the Executive Committee and the House of Delegates ask that you keep in mind the following policies which were discussed and voted upon at the annual conference, June 1949.

III. A. Of primary importance are the individual qualifications of a candidate such as qualities of leadership. The committee is concerned with the development of the Association and the profession. Therefore, members should have broad vision, the ability to evaluate trends, to translate them into action and to provide effective leadership in its broadest sense.

In considering candidates for the individual offices, duties for those particular offices should be borne in mind. The president, vice-president and speaker of the House of Delegates should have the ability to preside at general meetings and have a knowledge, or acquire a knowledge, of parliamentary procedures.

The secretary of the Association is also secretary of the House of Delegates and thus assists both the president and the speaker in carrying out their duties.

The treasurer, while not required to do bookkeeping, should have a knowl-

edge of figures. The treasurer is also a member of the Finance Committee which prepares a budget and supervises the expenditure of funds.

B. Of secondary importance are:
   1. To have different fields of activity represented.
   2. Geographical distribution.

C. Consideration of selecting the president from a member of the past Executive Committee because that would mean that the candidate would be informed of current problems and activities and could more effectively provide necessary leadership.

D. Consideration of selection of directors, composed in part of past officers or committee chairmen and in part members new to the Executive Committee who may in this way acquire experience which will qualify them as future officers. (Note: It has been the custom in the past to elect the outgoing president to a directorship.)

IV. All nominations should be sent to Lucille Daniels, Chairman of the Nominating Committee, care of the National Office, no later than November 15, 1949. The Nominating Committee will give full consideration to every candidate and will select those who in their opinion will best serve the Association in any given office. The Nominating Committee will present candidates for each office to the House of Delegates in 1950 for vote.

It will greatly facilitate the work of the Nominating Committee if you can indicate whether the candidate is willing to serve if elected.

Your cooperation is earnestly requested in making available to the Nominating Committee names of those individuals who in your opinion can provide effective leadership of the Association.

Please bear in mind that members of the Executive Committee are *not* required to perform routine duties of a particular office. These are carried out by your National Office staff.

A president, vice-president, secretary, treasurer, speaker of the House of Delegates and two directors for four-year terms are to be elected in 1950. The term of office of Catherine Worthingham and Dorothy Baethke, Directors, expire—1950.

According to the By-Laws, Article V, Section 4—"Only such members of the Association as have been active or life members or a combination thereof in good standing for at least the five years immediately preceding election and who have consented to serve are eligible for election as officers or directors of the Association."

Please list your candidates for any one or all of the above offices, each on a separate sheet. No candidate will be considered unless the following information is given:

1. Name.
2. Address.
3. Office for which candidate is suggested.
4. Member of the Association since .....
5. Present chapter membership.
6. Previous chapter affiliation.
7. Present employment. State whether supervisor, staff member, teacher, etc.
8. Association activities. List *any* offices which the candidate has held in chapters or in the national organization.
9. State briefly why in your opinion the candidate is qualified to serve on the Executive Committee according to the policies previously stated.
10. Is the candidate willing to serve if elected?

A small picture or snapshot should be included if possible.

Each sheet must be signed. If a chapter nominee, by the President; if an individual, with your name and address.

Please include date of filing.

Membership News

Chapter Activities

• *West Virginia Chapter:* A meeting of the West Virginia Chapter was held July 16th at Morgantown, with a dinner at the Country Club. Dr. Justice Pickett, orthopedist, who has just returned from Europe, spoke on "Physical Therapy in Europe." A business meeting was held the following day.

Personals

• Molly and Ed Johnson, both of Duke Hospital, announce the arrival on April 17, 1949, of David Lynn Johnson.

• Gertrude Mensch of Liberty, Kansas, recently joined the staff at Oteen, N. C. She is a graduate

of Percy Jones General Hospital and went to North Carolina following the completion of six months at the University of Oklahoma Hospital.

Marriages:

Stella Brubaker is now Mrs. Andrew F. Schott of Middleton, Wisconsin.

Virginia Calhoun is now Mrs. Virginia C. Smith of Johnstown, Pennsylvania.

Edith Dvorak is now Mrs. Edith di Silvestro of Philadelphia, Pennsylvania.

Margaret Einbecker is now Mrs. T. B. Walters of Monroe, North Carolina.

Patricia Erickson is now Mrs. Patricia E. Phillips of Cleveland, Ohio.

Clara Beth Haley is now Mrs. W. V. Green of Litchfield, California.

Mary Jane Henderson is now Mrs. Mary Jane Lindsay of Arrochar, Staten Island, New York.

Kathryn Jamison is now Mrs. Kathryn J. Aylsworth of Oxford, Pennsylvania.

Ivie J. Kalbfleisch is now Mrs. James Clark of Highland Park, Michigan.

Mary T. Kenny is now Mrs. Mary K. Hynes of Worcester, Massachusetts.

Zelda Miller is now Mrs. Zelda M. Morley of Flushing, New York.

Lucille Nordquist is now Mrs. Lucille N. Johnson of Arcata, California.

Elaine Ouellete is now Mrs. Thomas J. Keane of Lebanon, New Hampshire.

Phyllis Peterson is now Mrs. Phyllis P. Murphy of Columbus, Ohio.

Barbara Pitman is now Mrs. Robert Schiels of New York City.

Joyce Schira is now Mrs. Stephen Vogel of New York City.

Marilyn Staver is now Mrs. Marilyn S. Moelich of Traverse City, Michigan.

Margaret Marie Young is now Mrs. Marie Y. McDaniel of Drexel Hill, Pennsylvania.

New Members

• The following are newly accepted members of the American Physical Therapy Association:

Alida Currey
Sayed Kadry Hamed
Mrs. Mildred E. Shorter
Donnamae Winters
Gertrude Hirsch (Foreign trained—Member of Chartered Society of Physiotherapy, England)
Mildred Beatrix Marek (Foreign trained—Member of Canadian Physiotherapy Association)

• Recent graduates and former student members of the following schools:

Stanford University:
Ella G. Chandler
Nadine George
Burnett Hartsook
Dorcene Nelson
Betty K. Steele
Vilma-Katherine Tietjen
Kathleen Viakofski

University of Kansas:
Mrs. Marthann Brady

University of Southern California:
Mrs. Mary Jane Wissmann

General News

• "Physical Therapy in Rehabilitation" was discussed at a recent meeting of the Western States Conference of the National Rehabilitation Association in Seattle.

• A sound film, "No Help Wanted," is being made available for showings in connection with 1949 National Employ the Physically Handicapped Week. The film, which is available in both 16 mm. and 35 mm. sound, may be obtained from American Mutual Alliance, 919 North Michigan Avenue, Chicago 11, Illinois.

• The 30th Annual Meeting of the Ohio Society for Crippled Children will be held October 16-17, 1949, at the Deshler-Wallick Hotel, Columbus.

Are Handicapped Workers Efficient?

Production of handicapped and unimpaired workers is the same, according to a survey by the Bureau of Labor Statistics. This survey shows a relative output per worker of

101		100
for the impaired	against	for the unimpaired

In the survey were 895 impaired and 1,404 unimpaired workers. The impaired workers were about the same age, had the same experience, did the same job as the unimpaired.

The same survey shows that of the impaired workers—

40.1 per cent were as good as the unimpaired.
27.4 per cent were less efficient than the unimpaired, and
32.5 per cent rated better than the unimpaired.

Thus, 72.6 per cent of the impaired workers produced at rates as good as or better than their unimpaired fellow workers on the same jobs.

In this survey workers ranged from laborers to highly skilled mechanics. Impairments were serious orthopedic, vision, hearing, hernia, cardiac, tuberculosis, peptic ulcer, diabetic, and epileptic cases.

Physical Therapy in the Arctic

Miss Constance Beattie, the physical therapist from Brockville, Ont., who left her position with the East General Hospital in Toronto to accept an assignment in the Arctic to treat Eskimos suffering

from poliomyelitis, is now at her home post at Chesterfield Inlet where she expects to remain until fall.

The first physical therapist ever to go into the Arctic on such a mission, she flew to Chesterfield, which is one of the areas affected by the poliomyelitis epidemic which ran through the north early this year. Miss Beattie wrote to THE JOURNAL OF THE CANADIAN PHYSIOTHERAPY ASSOCIATION an account of her trip, part of which reads as follows:

"The Eskimos here are lovable, . . . very jolly and seemingly happy except that they each and every one have or are recovering from measles —a dread disease for the Eskimo, in fact, a killer. Their slanty eyes swollen even more shut with the disease are dark brown and normally sparkling. They are a straightforward people, grateful for all that is done for them. There are two men, two little girls, four teen-age boys and five little boys. But might I say now, *no* physio. The Winnipeg girls are doing a noble job but are busy in their own hospitals. Deer Lodge sends a physio every other morning but that is most unsatisfactory and leaves the physio aide here at the hospital with too much responsibility and work for her small shoulders. The hospital (King George) desperately needs a physio especially with their Eskimo wards. . . .

"I was told yesterday that they had flown in a Mennell apparatus weeks ago. Perhaps I'll get my pulley plinth yet! If any of you are interested in an Arctic winter, I suggest you contact Dr. W. J. Wood, Indian Health and Welfare Department, Winnipeg—I should be out by fall."

Coming Meetings

Date	*Organization*	*Place*
Nov. 7-9	National Society for Crippled Children and Adults	Commodore Hotel, New York, N. Y.
June 25-30, 1950	American Physical Therapy Association	Hotel Statler, Cleveland, Ohio

Index to Current Literature

Anterior Poliomyelitis

Therapeutic Problems Encountered in Acute Poliomyelitis. Robert B. Lawson. Minnesota Medicine, July 1949.

Arthritis and Rheumatism

Arthritis. Edward F. Rosenberg. Journal of the American Medical Association, July 2, 1949.

Rheumatoid Arthritis in the Young. Bernard Schlesinger. British Medical Journal, July 1949.

Psychogenic Rheumatism. William Tegner, Desmond O'Neill and Anna Kaldegg. British Medical Journal, July 1949.

New Problems of Rheumatism. British Medical Journal, July 1949.

Cerebral Palsy

Each Cerebral Palsied Child a Law Unto Himself and Therapy Must be Adapted Accordingly. Winthrop M. Phelps. Cerebral Palsy, Volume 10, Number 7.

Diathermy

Effect of Diathermy (Short Wave and Microwave) On Bone Growth in the Albino Rat. Charles S. Wise, Benjamin Castlemen and Arthur L. Watkins. Journal of Bone and Joint Surgery, July 1949.

Miscellaneous

Orthopedic Implications in Geriatrics. Jeanne Goldstein. Public Health Nursing, August 1949.

Peripheral Nerve Injuries

Nerve Injuries: Medical Treatment. (Some factors affecting the results of treatment of peripheral nerve injuries. "The investigation, an exploratory one, was intended to throw light on two allied problems: (1) the so-called psychological factors affecting recovery from physical illness and (2) the effects of physical disability on social and occupational adjustment." Lancet, May 21, 1949.

Rehabilitation

Diagnostic Clinics for Rehabilitation. A. R. Shands, Jr. Journal of the American Medical Association, July 16, 1949.

Speech

Athetoids Relax and Speak. Cara C. Hatcher. The Crippled Child, June 1949.

Reprints Available

One free copy of each scientific reprint (except the History of the American Physical Therapy Association, and the Anterior Poliomyelitis and Cerebral Palsy Issues of the REVIEW will be provided upon request to all members, students in the approved schools and libraries. A small charge is made as indicated for additional copies to members, students and libraries, and for all copies to nonmembers. The informational brochures are available to all without charge. To obtain reprints write: American Physical Therapy Association, 1790 Broadway, New York 19, N. Y.

PHYSICAL THERAPY, A SERVICE AND A CAREER
An illustrated brochure, describing the opportunities for a career in physical therapy, available scholarships and educational requirements for entering a school of physical therapy. (Made available through National Foundation for Infantile Paralysis funds.)

OUR ASSOCIATION
An informational booklet on the activities, scope and services of the American Physical Therapy Association.

PHYSICAL THERAPY
A question and answer article covering the usual queries received on physical therapy.

PHYSICAL THERAPY—*Suggestions for Prospective Students.*
Outlines the professional course of study for college students preparing for physical therapy.

CODE OF ETHICS
Ethics for the physical therapist of the American Physical Therapy Association.

ESSENTIALS OF PROFESSIONAL ETHICS IN PHYSICAL THERAPY. MARY HASKELL.

PERSONNEL POLICIES FOR QUALIFIED PHYSICAL THERAPISTS
Suggestions as to salary, hours, vacations, etc., by the American Physical Therapy Association.

APPROVED SCHOOLS OF PHYSICAL THERAPY
A list of schools approved by the Council on Medical Education and Hospitals of the American Medical Association.

EDUCATIONAL OPPORTUNITIES FOR PHYSICAL THERAPISTS
A list of postgraduate programs offered by the approved schools and a list of specialized courses for physical therapists.

PHYSICAL THERAPY SECTION: *Its Scope and Employment Opportunities.*
This consists of 12 articles by various contributors on physical therapy in a state crippled children's service, public health service, the cerebral palsy field, the Veterans Administration, the industrial clinic, a curative workshop, a large general hospital, a small general hospital, a children's hospital, crippled children's schools, the physician's office or clinic group and the psychiatric field.

CARE OF PATIENTS WITH INFANTILE PARALYSIS: *Correlation in the Nursing and Physical Therapy Services.*
CARMELITA CALDERWOOD HEARST (5c)

POSTURE TRAINING FOR ADOLESCENTS
CAROLYN BOWEN (5c)

INTEGRATION OF PRINCIPLES OF BODY MECHANICS AND POSTURE IN NURSING: *Demonstration Project at Vanderbilt University School of Nursing.*
MARGARET C. WINTERS. (10c)

PHYSICAL THERAPY AND CHEST SURGERY
FLORENCE S. LINDUFF. (10c)

BED EXERCISES IN EARLY CONVALESCENCE AND AMBULATION.
NILA K. COVALT, M.D. (10c)

THE RESPIRATOR IN THE TREATMENT OF ACUTE POLIOMYELITIS.
DOROTHY GRAVES. (10c)

PHYSICAL THERAPY MANAGEMENT OF LOWER EXTREMITY AMPUTEES.
PAIGE WEAVER. (10c)

TOYS, GAMES AND APPARATUS FOR CHILDREN WITH CEREBRAL PALSY.
GLADYS G. ROGERS AND LEAH THOMAS. (10c)

ANTERIOR POLIOMYELITIS: *Rehabilitation by Functional Exercises.*
EMIL D. W. HAUSER, M.D. (10c)

FUNCTIONAL TESTING AND TRAINING: *Physical Therapy Aspects.*
ROBERT L. BENNETT, M.D., AND HAZEL R. STEPHENS. (15c)

GUTHRIE-SMITH APPARATUS: *Its Construction and Use in Rehabilitation.*
KATHRYN S. BIER. (20c)

THE NEED FOR PHYSICAL THERAPY IN POSTPARTUM CARE.
WILLIE REBECCA HARVEY. (20c)

REHABILITATION OF THE INJURED CHEST.
VICTOR P. SATINSKY, MAJ. MC, AUS, AND DORA DYKINS (20c)

THE MEAUREMENT OF JOINT MOTION.
MARGARET LEE MOORE (25c)

THE PHYSICAL THERAPY REVIEW—*Special Anterior Poliomyelitis Issue.* July-August 1947 (75c)
The magazine contains 11 articles by leading physicians and physical therapists on research and treatment of polio. There are 16 abstracts of articles on polio from current medical journals.

A HISTORY OF THE AMERICAN PHYSICAL THERAPY ASSOCIATION.
IDA M. HAZENHYER. (50c)
An account of the Association's activities and growth from 1921-1946.

THE PHYSICAL THERAPY REVIEW—*Special Cerebral Palsy Issue.* May-June 1948 (75c)
This magazine contains 8 articles by leading physicians and physical therapists on research and treatment of cerebral palsy. There are 5 abstracts of articles on cerebral palsy from current medical journals.

Available free of charge from Joint Orthopedic Nursing Advisory Service, 1790 Broadway, New York 19, N. Y.:

MAKING PHYSICS A PART OF THE CURRICULUM: *Three methods of incorporating physics in the nursing school curriculum.*
HESSEL H. FLITTER, R.N.

THE PATIENT WITH BULBAR-RESPIRATORY POLIOMYELITIS.
FREDERIC J. KOTTKE, M.D., AND WILLIAM G. KUBICEK, PH.D.

Annual Reports of Chapter Secretaries—1948-49*

Alabama

Members—12 (All active)
Meetings—4
Projects: Started an education project to interest college students in Alabama in physical therapy as a career.
Social activities: One dinner party.

Arizona

Members—24 (All active)
Meetings—3 chapter meetings (two in Phoenix, one in Tucson). Local Tucson group held 5 meetings; local Phoenix group held 3 meetings.
Lectures: "Injuries of the Low Back"—R. E. Hastings, M.D.
Projects:
(1) Continuance of public education on the qualifications of the American Physical Therapy Association members and the nature of physical therapy.
(2) Publication of State directory.
Social activities: Local Tucson group dinner meetings.
Meetings with allied groups: Tucson group attended a "Round Table Discussion of Arthritis" at the Veterans Administration Hospital, conducted by local physicians carrying on a research project on arthritis.

Northern California

Members—220 (Active 154, inactive 14, associate 6, student 44, honorary 2)
Meetings—7
Lectures: "Construction of Braces and Artificial Limbs"—C. H. Hittenberger, Sr.
"Psychosomatic Implications of Physical Therapy"—Katherine Stilwell, Ph.D.
"Muscle Reeducation of Neuromuscular Conditions"—Herman Kabat, M.D.
"Speech Therapy in Relation to Physical Therapy Problems"—Mrs. Katherine Sutter
"Physical Therapy Used in Rheumatoid Conditions"—Frances Baker, M.D.
"Muscle Physiology in Relation to the Tear of the Supraspinatus Muscle"—Charles Bechtol, M.D.
"Physical Medicine in Second and Third Degree Burns"—Colonel A. E. White, M.D.
Social activities: Refreshments were served after two of the meetings and a social hour was held.
Meetings with allied groups: The occupational therapists were invited to all meetings.

Santa Barbara

Members—11 (Active 9, inactive 2)
Meetings—8
Lectures: 4
Social activities: One Christmas party; one double shower.
Meetings with allied groups: One with local physical education group.

Southern California

Members—230 (Active 182, inactive 15, associate 3, student 30)
Meetings—8
Lectures: "Electromyography" with demonstration—James Golseth, M.D.
Symposium on Multiple Sclerosis (with demonstration)—Leo Kaplan, M.D., Carl Von Hagen, M.D., Herman Kabat, M.D., and Margaret Knott.
"Physical Approach to Relaxation"—Eleanor Metheny, M.D.
"Positive Pressure Machine for Respiratory Polio"—Harold West, M.D.
"Speech Therapy"—H. R. Harrington, M.D.
"Teaching the Cerebral Palsied to Write"—Margaret Rood
Projects: Review of anatomy, with cadavers—Sarah Rogers of Children's Hospital. Five sessions—total attendance 38.
Social activities: Three dinner meetings and two picnics.
Other: Meeting to discuss legislation.

Carolina

Members—69 (Active 57, student 12)
Meetings—2
Lectures: "The Medical Treatment of Tuberculosis"—Ralph E. Moyer, M.D.
"The Surgical Treatment of Tuberculosis"—J. D. Murphy, M.D.
"Physical Therapy Problems in Maintaining Skeletal Alignment and Muscle Balance in Thoracic Surgery"—Mrs. Ila J. Amrhein
"New Developments in the Treatment of the Acute Stage of Poliomyelitis"—Robert B. Lawson, M.D.
"Psychiatry in Physical Therapy"—Angus Randolph, M.D.
"Emotional Problems in the Epileptic"—Richard Masland, M.D.
"Paraplegias"—Eben Alexander, M.D.
Movies: Operation—1st Stage Thoracoplasty
Operation—Pneumonectomy—J. D. Murphy, M.D.
Projects: Exhibit at the April meeting of the Carolinas-Virginias hospital administrators.
Social activities: Outdoor breakfast and social hour preceding dinner meeting.
Meetings with allied groups: Round Table—Allied Professions in a Program for the Physically Handicapped, with representatives from other professions participating.

Connecticut

Members—65 (Active 63, inactive 2)
Meetings—8
Lectures: "Social Service"—Emmanuel Morse
"Physical Therapists and Rehabilitation"—Nila K. Covalt, M.D.
"Sight"—Miss Bullis
"Alcoholism"—Dudley Miller
Projects:
(1) Newsletter published for first time this year (three editions).
(2) Rehabilitation Institute at the Hospital for the Chronically Ill and Infirm, sponsored by the Connecticut Occupational Therapy Association and the Connecticut Chapter of the APTA.
(3) Placement Committee started this year with a survey of 37 hospitals in the state regarding physical therapy facilities.
(4) Olga Martini gave a talk on "Physical Therapy in Chest Conditions" to the staff of the Veterans Administration Hospital at Newington.
Meetings with allied groups:
(1) Connecticut Occupational Therapy Association.
(2) Social Service Association.
(3) Connecticut Medical Society Conference.

*No report received from the secretary of the following chapters: Arkansas, Colorado, Illinois, Indiana, Eastern Missouri and Virginia.

Delaware

Members—12 (All active)
Meetings—10
Lectures: "Club Feet"—David J. King, M.D.
"Correlation of Physical and Occupational Therapy"—Margaret Gleave, O.T.R.
"Posture and Pronated Feet"—Irvine M. Flinn, Jr., M.D.
"Psychiatry and Physical Therapy"—Albert Ingram, M.D.
Lecture to Delaware Chapter of the National Society for Crippled Children and Adults—Eloise Cardullo.
Movies: "Peripheral Nerve Injuries"
Projects: Field trip to Children's Beach House, Lewes, Delaware
Social activities: Social programs following two business meetings.
Meetings with allied groups: Several meetings were attended by a small group of occupational therapists.

District of Columbia

Members—64 (Active 61, inactive 3)
Meetings—9
Lectures: "Congenital Deformities"—Frank M. Hand, M.D.
"Tendon Transference"—T. Wiley Hodges, M.D.
"U. S. Public Health Service Program"—A. William Reggio, M.D.
"High Resistance Exercises"—Charles S. Wise, M.D.
"Surgery of the Sciatic Nerve"—Hugo V. Rizzoli, M.D.
Movies: "Come Back," "They Do Come Back," "New Horizons."
"De Lorme Exercise Table"
"Sciatic Nerve Surgery and Follow-up Physical Therapy"
Projects:
(1) Encouraging active participation by all members.
(2) Endeavoring to create interest in physical therapy among high school groups.
Social activities: Picnic, Christmas party, two dinner meetings, two social sessions following regular meetings, cocktail party.

Florida

Members—28 (All active)
Meetings—3
Lectures: "Psychosomatic Aspects of Physical Therapy"—Doctor Fort.
"Convalescent Care in Polio Cases"—Robert L. Bennett, M.D.
"Cerebral Palsy"—Doctor Gillette.
Social activities: Steak dinners preceding meetings.
Meetings with allied groups: Guest groups have been invited to each meeting and those represented were teachers, nurses, occupational therapists, Red Cross workers, social workers.

Georgia

Members—39 (Active 35, inactive 4)
Meetings—3
Lectures: Report of delegate to 1948 Annual Conference of APTA—Mrs. Betty Schlosser. Report on exhibits at International Conference on Poliomyelitis—Helen Vaughn. Report on organization and interesting highlights of International Conference on Poliomyelitis—Mrs. Hazel Stephens
Meeting held in conjunction with joint meeting of physical therapists, occupational therapists and corrective therapists of Southeast
"Electrodiagnosis, Electric Stimulation and the Hydrogalvanic Bath"—with demonstration—Lewis Britt, M.D.
Social activities: Picnic and two dinners.
Meetings with allied groups: Joint meeting of physical therapists, occupational therapists and corrective therapists of the Southeast.

Iowa

Members—25 (Active 23, inactive 2)
Meetings—6
Lectures: Symposium on "Amputation"
Physiological Basis for Certain Therapies in Poliomyelitis
Movies: "Accent on Use"
"Crippled Children's Camps"
Projects: Poliomyelitis exhibit at State Fair, and exhibit in Iowa City.
Social activities: Get-acquainted party with new students, Christmas party, and social gathering after one lecture.

Kansas

Members—60 (Active 33, inactive 4, associate 2, student 21)
Meetings—6
Lectures: "Medical Practice Bills of Kansas"—J. L. Lattimore, M.D.
Report on meeting of Congress of Physical Medicine—Donald L. Rose, M.D.
History of the Institute of Logopedics—Mrs. Virgil Barrett, Speech Correctionist
Chest program and progressive relaxation—Staff of Wadsworth VA Hospital
Projects:
(1) Directory of all qualified physical therapists in Kansas
(2) Radio broadcast "Physical Therapy as a Profession and Career"
Social activities: Picnic and three dinner meetings.
Meetings with allied groups:
Kansas Occupational Therapy Association (two meetings)
Oklahoma Chapter of APTA
Missouri Chapter of APTA

Kentucky

Members—21 (All active)
Meetings—8
Lectures: "Scoliosis"—M. R. Colbert, M.D.
"Speech Correction"—Phyllis Morris
"Physical Therapy in Thoracic Surgery"—Mrs. Sarah Edlin
"Physiology of High Resistive Exercise"—W. M. Ewing, M.D.
"Multiple Sclerosis"—E. Roseman, M.D.
Projects:
(1) New directory and distribution
(2) Newsletter
Meetings with allied groups: One dinner meeting with occupational therapists.

Louisiana

Members—13 (Active 12, inactive 1)
Meetings—3
Lectures: "Amputations"—E. W. Wilbur, M.D.
"State Rehabilitation"—Mr. R. Hendricks
Movies: Two Army movies on amputations

Weekly movies on physical therapy and related subjects in allied fields at Veterans Hospital. Open invitation to city physical therapists.
Projects: Book containing physical therapy material sent to schools and colleges in Louisiana
Social activities: Refreshments and informal gathering after each meeting.
Meetings with allied groups: Personal invitations to one meeting sent to members of all interested groups, and Louisiana Occupational Therapy Association invited to one meeting.

Maine

Members—11 (Active 10, inactive 1)
Meetings—4
Lectures: "New Trends in Polio"—Thomas A. Foster, M.D.
"Fractures of the Hip and Characteristic Gaits"—Leo J. McDermott, M.D.
"Natural Type of Artificial Limb"—Mr. P. J. Norton and Mr. Bennington
Movies: "New Horizons"
Social activities: One luncheon meeting, one dinner meeting.
Meetings with allied groups: Occupational therapists

Maryland

Members—38 (All active)
Meetings—6
Lectures: "General Aspects of Psychiatry"—James M. Wygal, M.D.
"The Hand"—Raymond M. Curtis, M.D.
"The Thorax"—Mrs. Florence Linduff
"Physical Therapy in Other Countries"—Miss Connie Hartly Smith of Australia
Movies: "Hand Surgery"—shown by Dr. Curtis
Social activities: Dinner meeting (Miss Ransom, National President present), and address by Mrs. Linduff
Other:
(1) Field trip to Kabat-Kaiser Institute, Washington, D. C.
(2) Field trip to Walter Reed General Hospital, Washington, D. C.

Massachusetts

Members—274 (Active 177, inactive 13, associate 1, student 83)
Meetings—8
Lectures: Report on First International Poliomyelitis Conference
"Hip Reconstruction"
"Industrial Medicine"
"Psychiatric Aspects of Arthritis"
"Transplantation of the Cornea"
Movies: "Amputation Prostheses and Their Use"
Slides and pictures of Cornea Transplantation
Slides on Hip Reconstruction
Projects:
(1) Newsletters (two)
(2) Educational meetings (two)
Social activities: Dinner preceding all meetings
Meetings with allied groups: Met with New England Society of Physical Medicine. Subject: Physiologic Research as an Aid in Physical Medicine.

Eastern Michigan

Members—66 (Active 55, inactive 11)
Meetings—5
Lectures: Report on 1948 Annual Conference of APTA—Elizabeth Masola
"Shoulder Repair"—Doctor McDonald, Veterans' Hospital, Dearborn, preceded by tour of Hospital
Movies: Six movies scheduled with meetings were arranged by Dr. Max K. Newman to which the Eastern Michigan Chapter was invited:
"Orthopedic Rehabilitation of Spinal Cord Injuries"
"Rehabilitation of Chronic Neurological Cases"
"Forgotten Casualty"
"Institute of Rehabilitation of New York University"
"School of Another Chance"
"Brotherhood of Man" (Courtesy Walter P. Reuther, U.A.W., CIO)
Projects:
(1) Newsletter (Newsletters exchanged with ten chapters)
(2) Letter of greeting to new members
(3) Permanent mailing list on cards, including information obtained from questionnaires
Social activities: Two dinner meetings and a tea
Meetings with allied groups: Joint meeting with Michigan Occupational Therapy Association

Western Michigan

Members—29 (All active)
Meetings—4
Lectures: "Shoulder Disabilities"
"Mental Evaluation of the Physically Handicapped"
"Low Back Pain with Sciatica"
Movies: Slides showing progress and treatment of a badly burned individual
Slides showing amputee program
Social activities: Dinner preceding each meeting

Minnesota

Members—49 (Active 39, inactive 2, student 8)
Meetings—7
Lectures: "Crutch Walking"—Myron Leckeitner, M.D.
"Scoliosis"—John Moe, M.D.
"Rehabilitation of the Paraplegic"—Earl Elkins, M.D.
"Occupational Therapy Curriculum at the University of Minnesota"—Borghild Hansen
"Surgical Conditions of the Knee"—Richard Reilly, M.D.
Movies: "Paraplegias"
"Abnormal Motion of the Shoulder"
"Sciatic Pain and the Intervertebral Disc"
Projects:
(1) Construction of miniature Physical Therapy Clinic for exhibit at Upper Midwest Hospital Convention.
(2) Monthly newsletter started. Sent to each member and various other chapters.
(3) 1948-49 Directory sent to all chapter members
(4) Card file of Active members
Social activities: Physical Therapy and Occupational Therapy Departments of University of Minnesota open house. Inspection of new Occupational Therapy quarters. Refreshments served by University Student Physical Therapy Club.
Three dinner meetings.
Party and gift presentation honoring Sara Kollman and Marion Denny—two retiring Chapter members.
Meetings with allied groups:
(1) Discussion of occupational therapy and examples of the correlation with physical therapy at the University of Minnesota.
(2) Occupational therapists invited to all lectures.
(3) Luncheon with Minnesota Hospital Association.

(4) Minnesota Chapter of APTA represented at Upper Midwest Hospital Convention with film and miniature physical therapy exhibit.
(5) Participation in program of the Polio Emergency Volunteers (group of women training to give assistance in case of another polio epidemic).
(6) Numerous individual talks on physical therapy given to nurses, medical technicians, social workers, x-ray technicians and parents of spastic children.
(7) Vocational guidance activities consisting of distributing printed brochures—"Career Conference" and "Open House."

Southern Minnesota

Members—17 (Active 13, associate 4)
Meetings—10
Lectures: Report on International Poliomyelitis Conference—Doctor Martin
Relationship Between Members of Department of Physical Medicine and Psychiatric Patients Referred for Therapy—H. P. Rome, M.D.
Movies: "Control of Voluntary Muscles"
Projects: Valentine party for polio and paraplegic patients at St. Mary's.
Social activities: Picnic in honor of students completing physical therapy training, and Christmas party for members of entire Physical Medicine Department.

Western Missouri

Members—24 (Active 23, inactive 1)
Meetings—7
Lectures: "Cerebral Palsy and the Value of Surgery in Cerebral Palsy"—M. E. Pusitz, M.D.
Report of 1948 Annual Conference of APTA
Round table discussion of article "New Principles of Neuromuscular Reeducation" by Herman Kabat, M.D.
Report by Miss Nevin on training in cerebral palsy under Doctor Phelps of Baltimore.
Movies: "School of Another Chance"
"Orthopedic Rehabilitation of Spinal Cord Injuries"
Movies taken by Miss Daniels on her trip to Europe
Social activities: Buffet supper, and a Sunday morning outdoor breakfast
Meetings with allied groups: Movies and lecture with occupational therapists of community.

Nebraska

Members—16 (Active 15, associate 1)
Meetings—9
Lectures: 4
Projects: Vocational counseling of high school groups concerning physical therapy as a career.
Social activities: Picnic, luncheon meeting, dinner meeting, and dinners honoring special guests

New Jersey

Members—21 (Active 18, inactive 3)
Meetings—6
Lectures: "Important Aspects in the Treatment of Cerebral Palsy"—Sidney Keats, M.D.
"Speech Therapy in Cerebral Palsy"—Mrs. Elizabeth Bender
"Treatment of Multiple Sclerosis at the Kabat-Kaiser Institute"—Marion Monroe
"Pre- and Postprosthetic Training of Amputees at the Kessler Institute"—Signe Brunnstrom
"Physical Therapy for the Paraplegic at the Kessler Institute"—Genevieve Reilly
"Treatment of Peripheral Vascular Diseases"—B. S. Troedsson, M.D.
Movies: "Institute of Rehabilitation and Physical Medicine at Bellevue"
"Spinal Cord Injury"—from the Institute for Crippled and Disabled
Social activities: Picnic
Meetings with allied groups: Luncheon hostess at the Middle Atlantic Hospital Assembly Physical Therapy Section.

Central New York

Members—37 (Active 24, associate 13)
Meetings—4
Lectures: "Neurological Aspects of the Physically Handicapped"—William Peacher, M.D.
"Use of Physical Medicine in the Care and Treatment of Orthopedic Cases"—Stephen Bastoble, M.D.
Projects: Talk on physical therapy given to high school students on Career Day.

Eastern New York

Members—19 (Active 17, inactive 2)
Meetings—9
Lectures: "Paraplegia"—Doctor Claire
"Amputees"—Mr. Thomas
"Scoliosis"—Doctor Dexter
Report on 1948 Annual Conference of the APTA
Social activities: Two dinner meetings
Meetings with allied groups: Sponsored an open meeting at Sunnyview Hospital, Schenectady. Topic—Rehabilitation. Demonstration—Mary Eleanor Brown. Speakers—Mr. Bohlin, Doctor Steinfeld, Philip Keiker.

New York

Members—245 (Active 189, inactive 20, associate 2, student 34)
Meetings—4
Lectures: "A New Institute of Rehabilitation"—Herbert Kent, M.D.
"Functions of the Medical Social Worker in Relation to Physical Medicine"—Mrs. Glee Dervent
"Legislation in New York State"—Elizabeth Addoms and Floy Pinkerton (Miss Addoms gave a short history of the present legislation and conducted a discussion.)
"Educational Program"—Ellen Covell

Western New York

Members—65 (Active 62, inactive 3)
Meetings—4
Lectures: "Bracing and Drug Therapy in Cerebral Palsy"—Fred Zuck, M.D.
"Physical Medicine in Rehabilitation of the Veteran"—Doctor Tarbell
"Erie County Health Department and Its New Programs"—Ruth Rives
Movies: "Progress Checks on Cerebral Palsy Patients at Edith Hartwell Clinic"
"Physical Therapy at Batavia Veterans Hospital"
Projects: Round table discussion on multiple sclerosis
Social activities: Picnic and tour of Edith Hartwell Clinic at Leroy, N. Y.
Dinner meeting with Miss Ransom, National President
Meetings with allied groups:
(1) Spring conference of Alumni Association University of Buffalo Medical School.
(2) Physical Medicine meetings at convention of New York State Medical Association

Ohio

Members—130 (All active)
Meetings—1 annual state meeting
Lectures: "Physical Medicine"—Shelby G. Gamble, M.D.
Brace Demonstration and Lecture—Charles Rosenquist
"Orthopedics"—Joseph T. Leach, M.D.
"China"—Arthur Tye
Movies: "Plastic Surgery"
"A Day with a Spastic"
Social activities: Luncheon and dinner meeting
Meetings with allied groups: Meeting with Ohio Hospital Association

Southwestern Ohio District

Meetings—7
Lectures: "New Concepts of Rehabilitation"—Robert Boyle, M.D.
"Dissections of the Shoulder, Arm and Hand"—Joseph Barnhart, M.D.
"Correlation between Polio Incidence and the Removal of the Tonsils"—Sam Seltz, M.D.
"A Modern Concept of the Use of Physical Therapy"—David Sloane, M.D.
"Heat Loss from the Periphery of the Body as Estimated by the Stewart Calorimeter"—Sophia Ernst
Movies: "The Anatomy of the Arm, Forearm and the Hand"
Projects: Anatomy review
Social activities: Picnic
Meetings with allied groups: Meeting with the Nurses Alumni at Good Samaritan Hospital, Cincinnati
Other: Tour through Rehabilitation Center of the Goodwill Industries, Cincinnati, and the Veterans Administration Hospital, Fort Thomas, Kentucky.

Central Ohio District

Meetings—4
Lectures: "Convalescent Care for Children"—C. W. Hosterman, M.D.
Movies: "Shades of Gray"
Projects: Hostesses for Ohio State annual spring meeting
Social activities: Picnic
Meetings with allied groups: Joint meeting with occupational therapists and conferences with Ohio Hospital Association
Other: Two clinics held in Columbus by Winthrop M. Phelps, M.D.

Northern Ohio District

Meetings—5
Lectures: "Rehabilitation Program"—Harry T. Zankel, M.D.
"Research Problems in Polio"—Morris Schaeffer, M.D.
"Shoulder Conditions"—John Murphy, M.D.
Social activities: Picnic
Meetings with allied groups: Guests of Ohio Orthopedic Surgeons at their state meeting
Other: Tour through Crile Veterans Administration Hospital, Rehabilitation Section

Oklahoma

Members—15 (All active)
Meetings—6
Lectures: "Treatment of Poliomyelitis as Carried on in Warm Springs, Georgia"
"The Arthritis and Rheumatism Foundation"
"Orthopedic Aspects of Rheumatology"
"Arthritis, the Crippler"
"Physical Aspects of Hemiplegia Patient"
"Emotional Problems of Hemiplegia Patients"
Movies: Slides on arthritis
Projects: Newsletter
Social activities: Dinners and picnics
Meetings with allied groups:
(1) Meetings with occupational therapists.
(2) Joint meeting with the Kansas Chapter of the APTA

Oregon

Members—34 (All active)
Meetings—7
Lectures: "Closure of the Epiphysis"
"Indications and Use of the Sayre Head Sling"
"Polio"—Doctor Pohl
"Arthritis"
Movies: "Peripheral Nerve Injuries"
"Therapeutic Exercise"
Projects:
(1) Exhibit during Nursing Recruitment Week
(2) Directory published and mailed to all physicians in Oregon
(3) Lectures on physical therapy given by members to physical education teachers group.
Social activities: Picnic
Meetings with allied groups:
(1) President attended meeting of Oregon State Federation of Professional Societies in regard to bill before legislature.
(2) Physicians and nurses invited to lectures.
(3) American Medical Association meeting on polio.
(4) Two meetings with State Board of Health.

Pennsylvania

Members—113 (Active 86, inactive 7, student 20)
Meetings—8
Lectures: "Electric Shock Therapy"—William R. O'Brien, M.D.
"Use and Application of Cold Wet Pack" with demonstration—S. Paul Campbell
Lecture on various types of prosthesis, their manufacture and fitting—by Mr. Hanger of the Hanger Artificial Limb Co.
Movies: "Widener School for Orthopedically Handicapped Children, Philadelphia, Pa." Discussion led by Elizabeth O'Dwyer
"Lower Extremity Amputations and Fitting of Prosthesis"—U. S. War Department film.
Projects: Publication of a newsletter which is sent to all members and to various other chapters.
Social activities: Dinner meeting.
Other: Mildred Elson reported on her trip to England and other European countries.

Western Pennsylvania

Members—63 (Active 40, inactive 4, student 19)
Meetings—5
Lectures: "What the Physical Therapist Expects from the Orthopedic Surgeon"—David Schwartz, M.D.
"An Over-all View of the Handicapped"—Wilton H. Robinson, M.D.
"Pain"—Yale David Koskoff, M.D.
Projects: Printing of a chapter directory.

Puerto Rico

Members—13 (All active)
Meetings—4
Lectures: "Rehabilitation in Toronto, Canada"—Harold Storms, M.D.

"Rehabilitation at the Institute of Rehabilitation, Bellevue, New York University"—Donald Covalt, M.D.
Movies: "Rehabilitation"—Toronto
"Rehabilitation"—New York

Rhode Island

Members—13 (All active)
Meetings—3
Lectures: Report and round table on 1948 Annual Conference of the APTA
Other: Meeting with Miss Elson

Tennessee

Members—17 (Active 14, associate 3)
Meetings—1
Lectures: "Developments and Achievements in Physical Therapy with Particular Reference to the American Physical Therapy Association"—Jessie L. Stevenson
"The Physical Therapy Situation in Tennessee"—Helen Thorp
Movies: "Rehabilitation of Chronic Neurological Cases"
"Johnnie's Seven League Boots"

Territory of Hawaii

Members—10 (All active)
Meetings—9
Lectures: "Modern Aspects of Physical Therapy"—Major Kreider
"National and Local Activities of the National Foundation for Infantile Paralysis"—Carolyn Kingdon
Social activities: Two dinner meetings
Meetings with allied groups: One meeting held jointly with members of the Occupational Therapy Association.
Other: Visits to Physical Therapy Departments at Tripler Hospital and the Sultan Foundation Nursery School.

Texas

Members—71 (Active 62, inactive 3, associate 1, student 5)
Meetings—1 state meeting, one meeting of Fort Worth section, one meeting of Galveston section
Lectures: *State meeting:*
"The Relationship of the Physical Therapist to Other Medical Groups"—Ben Boynton, M.D.
Fort Worth section meeting:
"Hemiplegia"—T. W. Wade, M.D.
"Rehabilitation"—Ben Boynton, M.D.
Galveston section meeting:
"Cerebral Palsy"—O. O. Selke, M.D.
"Treatment of Acute Polio"—Theodore Panus, M.D.
Movies: "Rehabilitation"
Projects: Educational program to acquaint public with the work done by physical therapists. This has been accomplished through the medium of
(a) 1200 inches newspaper coverage
(b) Several hours of radio time
(c) Talks to organizations such as the Rotary Club, Junior League, Parent-Teachers Association.
Social activities: Cocktail party and luncheon, tea, and a barbecue.
Meetings with allied groups: Members have met with groups such as nurses and occupational therapists, and their groups are invited to and have attended chapter meetings.

Utah

Members—15 (Active 11, inactive 2, associate 2)
Meetings—8
Lectures: "Polio"—John A. Anderson, M.D.
"E.D.X."—demonstration by chapter member
Movies: "The Sky is the Limit"—amputation film.
Projects:
(1) Hospital personnel policies
(2) Establish chapter newsletter
Social activities: Dinner meeting in honor of Mary Haskell, National Secretary of the APTA, and refreshments served following several business meetings held at various members' homes.

Washington

Members—80 (Active 72, inactive 8)
Meetings—10
Lectures: "Treatment of Fractures"—John LeCocq, M.D.
"Treatment of Hemangiomata"— H. E. Coe, M.D.
"Care of Spinal Cord Injuries and Amputees"
"Postoperative Knees"—Doctor Rogge
Projects: Our biggest project has been the formulation and passage of our Bill of Registration. Our chief conversation and practically all of our meetings included some remarks about H.B. 157. At the time of Miss Ransom's visit to Washington the bill was on the Governor's desk. It has since been signed—and is now law.
Social activities: Dinner meetings and Christmas party.
Meetings with allied groups: Our executive committee had a meeting with a group from Washington's Occupational Therapy group to discuss and proceed with plans for making a joint brochure. This was accomplished, and the brochures were distributed.
Other:
(1) This year as in the past we have published monthly newsletters to be sent to all Washington physical therapists, to National Office, and to exchange with six other chapters.
(2) A portable bulletin board was made for the chapter so that all material once read at the chapter meetings could be posted for further study.
(3) A poster on "Hemangiomata" was made for the 1948 Annual Conference of the APTA.
(4) Special notices and letters to "Registry P.T.'s" regarding legislation.

West Virginia

Members—14 (All active)
Meetings—4
Lectures: "Cerebral Palsy"—A. Lutz, M.D.
"Low Back Pain"—R. Scott, M.D.
Projects: Sending CARE package.

Wisconsin

Members—100 (Active 57, inactive 5, associate 5, student 33)
Meetings—4
Lectures: "Recent Advances in Psychiatry"—L. Dansiger, M.D.
"Indications and Contraindications of Ultraviolet"—S. Johnson, M.D.
"Control Bone Growth by Epiphyseal Staplings"—Doctor Clark
Movies: Slides were shown in connection with the above lectures.
Projects: Working to provide a professional status in regard to salaries for physical therapists in the state of Wisconsin
Social activities: University of Wisconsin Physical Therapy Club gave a tea honoring Mildred Elson, Executive Secretary of the APTA
Meetings with allied groups: A two-day joint meeting of the Wisconsin Chapter of the APTA and the Wisconsin Occupational Therapy Association.

Abstracts

John S. Coulter, M.D.

Carditis in Poliomyelitis: An Anatomic Study of Thirty-five Cases and Review of the Literature

Theodore E. Ludden, M.D., and Jesse E. Edwards, M.D., from the Mayo Clinic, Rochester, Minn. In THE AMERICAN JOURNAL OF PATHOLOGY, 25:3:357, May 1949.

This investigation was undertaken because of the relative paucity of reports in the literature regarding cardiac lesions in cases of acute poliomyelitis and because we observed certain unusual cardiovascular lesions during the 1946 epidemic in Minnesota.

Myocarditis occurs frequently in acute poliomyelitis, having been observed in 14 (40.0 per cent) of 35 cases of fatal poliomyelitis.

Acute vegetative endocarditis and endarteritis of a patent ductus arteriosus may occasionally be found in acute poliomyelitis. One example of each of these lesions was present among the cases in this study.

Since the cardiovascular lesions occurring in the cases included in this study were otherwise unsatisfactorily explained, poliomyelitis virus must be considered as a possible cause of such lesions.

Proof that cardiovascular lesions in acute poliomyelitis are caused by the poliomyelitis virus will depend on demonstration of the virus in the lesions and the experimental production of such lesions.

The diagnosis of myocarditis in acute poliomyelitis is seldom made during life. Myocarditis should be suspected in every patient who is seriously ill with acute poliomyelitis.

Myocarditis, as observed in this series of cases, was usually more severe and proportionately more common in adults than in young children.

The ratio of males to females in the group of patients with myocarditis was 2.5:1, but since the ratio of males to females in the study was more than 3:1, actually a slightly greater proportion of females had myocarditis.

There was no specific correlation of type of paralysis—bulbar or spinal—with the presence or absence of myocarditis.

The actual role of myocarditis as a cause of sudden death in acute poliomyelitis could not be determined in this study, except in one patient, who had a perforation of the right atrium. Three of the 6 patients who died suddenly were found to have myocarditis, but all of these patients had bulbar involvement, which might have explained their sudden deaths.

The Ataxias: A Review

David Fiske, M.D., Los Angeles. In ARCHIVES OF INTERNAL MEDICINE, 83:6:593, June 1949.

Classic descriptions of the ataxias in textbooks are short and convincing, comprising two or three paragraphs, and frequently giving the impression that all of importance is known and well established. Certain "classic, pathognomonic" characteristics are described, with the knowledge of which one can make the diagnosis infallibly.

Examination of the literature discloses considerable confusion concerning ataxia. The confusion is further emphasized by the absence of an adequate review of the subject.

It is felt, therefore, that the present attempt to summarize some of the pertinent data in the literature and associated efforts to simplify the classification of ataxia may be of help to the nonspecialist.

Though one is not generally accustomed to thinking in such terms, there are, in reality, many types of ataxia.

As one reconsiders the various descriptions, observations and opinions outlined it may seem that a good deal of hair-splitting exists. One must get down to fundamentals and think of dynamics. Even hereditary diseases, when viewed in the newer light of Beadle's work, may appear in the nature of incomplete metabolic processes, amenable to correction. To assume that heredity alone is enough to account for the onset of a disease in adult life is unreasonable.

To be sure, these various ataxias may be different entities, but one is not in the position to say that they are. One must think in terms of fundamental physiology and dynamics and the various possible etiologic factors. Only in this way can one make progress toward the ultimate goal, which should be to understand these disease processes thoroughly, to pigeonhole them correctly and, above all, to treat them more satisfactorily.

Radioactive Isotopes in the Study of Peripheral Vascular Disease: I: Derivation of a Circulatory Index

Morris T. Friedell, M.D., Fenton Schaffner, M.D., William J. Pickett, M.D., and Irvin F. Hummon, Jr., M.D., Chicago. In ARCHIVES OF INTERNAL MEDICINE, 83:6: 608, June 1949.

Methods of determining the peripheral blood supply, with a consideration of the use of radioactive isotope tracers in this problem, are discussed.

The present study may be summarized as follows:

(1) One hundred patients from the wards of the Cook County Hospital were each given an intravenous injection of 20 microcuries of P^{32}, and the "build-up" curves indicating deposition of the radioactive isotope were determined. A semilogarithmic plotting of these curves resulted in what was essentially a straight line; the reciprocal of its slope was considered the index of circulation. These indexes fell into a normal distribution pattern, and the patients with arteriosclerosis and those over 50 years of age fell into well defined groups. The diffusion of P^{32} into the tissues was faster in older and in arteriosclerotic patients. Capillary dilatation is thought to be the chief cause of this phenomenon.

(2) Observations of previous workers on capillary dilatation and stasis are discussed. The concept that stasis due to capillary dilatation, rather than vascular spasm, is responsible for the signs and symptoms of peripheral arteriosclerosis is presented.

(3) Variations in the index will be presented in a subsequent communication, and the diagnostic and prognostic significance of variations in the index will be discussed.

Radioactive Isotopes in the Study of Peripheral Vascular Disease: II—Method of Evaluation of Various Forms of Treatment

Fenton Schaffner, M.D., Morris T. Friedell, M.D., William J. Pickett, M.D., and Irvin F. Hummon, Jr., M.D., Chicago. In ARCHIVES OF INTERNAL MEDICINE, 83:6: 620, June 1949.

The derivation of an index of circulation, calculated from the rate of diffusion of intravenously injected radioactive phosphorus into the tissues of the lower extremity, is reviewed.

The effect of treatment on this index of circulation was determined. Four forms of treatment were used: administration of histidine monohydrochloride and ascorbic acid, lumbar sympathetic block with procaine hydrochloride, administration of test doses of 500 mg. of tetraethylammonium chloride and lumbar sympathectomy.

The variations in the circulatory indexes were interpreted as signifying the response of the capillary bed to peripheral vasodilators. The capillaries are considered to have an independent circulation, based largely on the demand for and deficit of oxygen. The responses to treatment in the patients in the four groups were as follows: In group 1, the capillary tone was restored; in group 2, minor vasospastic elements were relieved but capillary dilation persisted; in group 3, major vasospastic elements were relieved but capillary dilation persisted or increased, and in group 4, deterioration of peripheral circulation was almost complete and amputation was required.

Radioactive phosphorus is useful as a diagnostic and prognostic tool in the evaluation of peripheral vascular states, such as arteriosclerosis obliterans.

Neurocirculatory Asthenia

Walter M. Bartlett, M.D., F.A.C.P., Atlanta, Ga. In ANNALS OF INTERNAL MEDICINE, 30:5:966, May 1949.

In our experience neurocirculatory asthenia accounts for 6.8 per cent of the admissions to the cardiovascular section of a large general hospital in the United States; 4.6 per cent of the admissions to a comparable unit in the European Theater of Operations and 6.3 per cent of the admissions to the cardiovascular section of a Regional Hospital in the United States.

It was found to be an excellent policy in our series as well as those treated by Hill and Dewar to forbid further medical examinations or the taking of pulse rates, blood pressure or temperature once the original complete examination was finished. This gave no further suggestion to the patient that anything but recovery was expected. Graduated physical exercise and reassurance by all concerned was the keynote of treatment. Exercises were started with easy drill and physical exercise under careful supervision. Progress was required but it could be slow for some groups and more rapid for others. Group psychotherapy was found to be most helpful in the hands of physicians possessed of the necessary orientation and ability. Privilege rewards for accomplishment were considered extremely helpful in keeping up the interest of participants. Cases not making satisfactory progress were counseled by the psychiatrist and those responding well were discharged from the hospital without further examination.

The pathogenesis of neurocirculatory asthenia has been studied by a great many careful observers and specialists in various fields of medicine. That the symptoms can be produced physiologically in susceptible individuals has been shown conclusively. It also has been shown that the symptoms are usually relieved by physiological rest and measures directed toward improved physical adaptation. Methods for the detection and differential diagnosis have been discussed and the problem from a military standpoint is reported. Experience with a large number of patients suffering with this manifestation of a psychosomatic disease undoubtedly has served to familiarize many physicians with a practical method of dealing with these daily problems.

Fibrositis

George D. Wilson. In SOUTHERN MEDICAL JOURNAL, 42:5:387, May 1949.

Classification of fibrositis into two common types was found most convenient in this series. Primary fibrositis is that type unaccompanied by and independent of other disease. Secondary fibrositis was designated as that type secondary to hypertrophic arthritis, alcoholism, diabetes, tuberculosis, menopausal syndrome, faulty metabolism, hypothyroidism and repeated trauma.

The use of goniometry is most important in that it measures in degrees the limitation of joint motion. Likewise, goniometry reveals the patient's clinical improvement under treatment. It was found helpful in the thoracolumbar and dorsodynia cases to use the tape line to measure trunk flexion, finger tip to floor and to measure respiratory excursions.

Physical therapy offers a superior form of treatment for fibrositis. Fibrositis is best managed in office practice on a biweekly or triweekly basis and at the same time the patient should continue his daily routine of activity. The physician wisely advises the patient that this condition may recur or become chronic. Treatment requires considerable patience and perseverance on the part of both patient and physician.

The local application of deep heat with short wave diathermy is most beneficial. The most efficient method was found to sandwich the involved area between pad applicators. The use of microthermy was found just as efficient and it is best to inform the patient there may be an aching or drawing sensation while under the diathermy. Following the use of diathermy, massage is employed, at first light massage to the involved areas, and . . . gradually much firmer pressure should be used, and petrissage as the patient's improvement permits. Active exercises are mentioned here in fibrositis only because it was found advisable for patients to carry the extremities through their normal range of joint motion as far as the pain and tense muscles will permit. Forced stretching of tense fibrositic involved muscles by manipulation or pulleys without first obtaining relaxation through the use of heat leads to aggravation or early recurrence of an inflammatory process. Active exercises are advised as tense, painful muscles will permit an increased range of motion. As the pendulum swings surely from overrest to overactivity in medicine, it is timely that exercises be prescribed as the condition of the patient warrants.

The use of neostigmine 1 cc. of 1:2,000 solution subcutaneously, given consecutively for 7 to 10 days, did not materially shorten the course of the disease but appeared to speed the time of relief from the complaint of tenseness, permitting earlier freedom of motion. It is an adjunct to the physical therapy.

Treatment of Arthritis

Ralph Pemberton. In PENNSYLVANIA MEDICAL JOURNAL, 52:712, April 1949.

The syndrome of arthritis is not so difficult of successful treatment as is usually believed. It is not a disease of joints but a systemic disease with joint manifestations. There is no single curative measure of therapy.

General order of treatment:

(1) Rest, systemic as well as local.
(2) Psychic evaluation.
(3) Sedation and/or stimulation; never opiates.
(4) Optimal nutrition in a refined sense, including accessory vitamins if necessary.
(5) Proper gastrointestinal function.
(6) Examination of the blood and body chemistry.
(7) Time for establishment of a general equilibrium.

(8) Psychic reeducation.
(9) Examination for foci of infection.
(10) Medication, such as iron, arsenic, or nux vomica.
(11) Replacement therapy when indicated.
(12) Treatment of foci, conservatively.
(13) Use of physical therapy, conservatively—chiefly heat, gentle massage, postural exercise.
(14) Orthopedic help.
(15) Last, if at all, gold, vaccines, or nonspecific proteins.

Recent Concepts Regarding the Spread and Treatment of Poliomyelitis

Robert B. Lawson. In NEW ENGLAND JOURNAL OF MEDICINE, 239:994, December 23, 1948.

Poliomyelitis is a worldwide disease affecting all races and classes of people. It is recognized to be most important as an epidemic disease, however, in North America, the Scandinavian countries, Great Britain and elsewhere in Europe.

The main treatment of poliomyelitis is symptomatic and at present is usually some modification of the Kenny technic. The chief differences in the Kenny regime and so-called "orthodox" treatment are that muscle reeducation, including passive motion of the extremities, is started earlier in the Kenny program; that immobilization is much more complete in the "orthodox" method; and that Miss Kenny treats contractures by application of heat and tendon stretching rather than by corrective appliances.

There are many minor variations in the technic of treatment, of course, but it does not seem that many of them are important. Many different methods of treatment between these two extremes have been used for the past 30 years. Some men carried out a program of treatment very similar to Miss Kenny's for years before her advent. At present most medical centers have adopted treatment schemes that are very similar to the Kenny method, without its rigid barriers to modification.

It is of interest to compare, if possible, the results of treatment by these various methods. One cannot be dogmatic about such a comparison, for each investigator has a different method of evaluating results. However, a review of all the available articles that include specific figures shows very similar therapeutic results. Mortality rates over the past 30 years have varied, and there has been some variation in end results, but there appears to be no really significant difference in results obtained by the various methods.

The first fairly satisfactory statistics from the Kenny Institute fail to prove any superiority for this method of therapy. Lawson, however, would not go back to the period of long immobilization in casts. It does seem that the Kenny method of treatment is more comfortable for the patient and probably makes the recovery of muscle function easier, since the peripheral tissues are kept in better tone.

Joint Manipulation in Rehabilitation

R. J. Talbot, F.R.C.S.Ed., D. Phys. Med. In BRITISH JOURNAL OF PHYSICAL MEDICINE, 12:3:62, May-June 1949.

A frequently employed physical method in rehabilitation from disease or injury is movement by joint manipulation. Its object is the restoration of the full anatomical range of movement to any joint which is either directly or indirectly restricted. Joint manipulation entails the use of scientifically applied force to secure a range of movement greater than that obtainable by the patient's voluntary action. Such manipulation is to be distinguished from manipulation for reduction of dislocation or for setting a fractured bone, but, similarly, it should be performed by qualified medical personnel.

Manipulation is an aid to other physical measures which must both precede and follow manipulation. The early and adequate application of these measures reduces the necessity for joint manipulation, particularly in the acute phase of chronic arthritis and trauma. Neglect renders manipulation the more necessary.

Manipulation may be divided into two types, major and minor. *Major manipulation* is employed in chronic traumatic and disease conditions when great restriction of movement exists, and when response to minor manipulation is negative or unreasonably slow. Repeated minor manipulations follow this operation. *Minor manipulations* are adopted when a gradual stretching of shortened structures is required, as in cases of disuse, contracture, cicatrization, prolonged immobilization or in soft-tissue lesions.

General principles.—All joint manipulations conform to certain principles, which are as follows:

(1) To secure greater movement of the joint with the patient relaxed, by employing gentle passive force beyond the range obtainable actively by the patient.
(2) To protect manually the component bones and ligaments of the joint.
(3) To apply a degree of traction of the distal upon the proximal bone or bones of the joint.
(4) To limit movement to the anatomical range of that joint.
(5) To overcome the obstruction encountered, by means of a deft, well-practiced increase of force.
(6) To cease applying force when "give" has occurred and the full range in the desired direction has been obtained.
(7) To advance movement only when complete relaxation is present.

Muscular Atrophy in Diseases of the Lower Motor Neuron: Contribution to the Anatomy of the Motor Units

Gunnar Wohlfart, M.D., Stockholm, Sweden. In ARCHIVES NEUROLOGY AND PSYCH., 61:6:599, June 1949.

The microscopic picture of muscular atrophy secondary to pathologic changes in lower motor neurons is described in detail. The material comprised specimens of muscle from 46 cases of amyotrophic lateral sclerosis, in 2 of which autopsy was performed; 8 cases of progressive neural muscular atrophy; 24 cases of polyneuritis; 2 cases of periarteritis nodosa, in 1 of which autopsy was done; 4 cases of porphyria, and 6 cases of syringomyelia, 1 with autopsy. Furthermore, a muscle was examined from a rabbit in which ischemic changes in the spinal cord had been artificially produced. The muscle material from cases of acute poliomyelitis has been reserved for a later report. Certain results, however, are incidentally mentioned.

Biopsy of muscle is of definite value for the establishment of the diagnosis of the aforementioned diseases.

In muscular atrophy due to successive destruction of individual lower motor neurons, the muscle picture exhibits certain characteristics. In such a case biopsy often produces conclusive evidence for the diagnosis of "successive, disseminated neurogenic muscular atrophy." This type of disease is characterized by the atrophy of fibers in groups, a number of which are visible in a transverse section of the muscle. The fibers of one and the same group exhibit the same degree of atrophy, but the groups show different stages of atrophy. The arrangement and appearance of the muscle fibers in these groups, as well as their relation to their environment, is described in detail.

Athetoids Relax and Speak

Caro C. Hatcher, Speech Therapist, Children's Hospital School, Eugene, Ore. In THE CRIPPLED CHILD, 27:1: 14, June 1949.

Speech training for athetoids is one of the most challenging fields in speech therapy. Alert as these cerebral palsied persons are, observations on their part have given them a feeling of pattern and a knowledge of speech production long before they arrive at their training period. However, they are defeated in actual speech by a voluntary tension that has become habitually a part of their conduct.

We are confronted, therefore, with the major problem of dealing with this voluntary tension which is controlled only by relaxation and in diverting attention away from performance. Actual therapy does not have to be an initial part of the program; in fact, it is not necessary for some time. I feel that it should be postponed until adequate personal relationships are established and a total picture of the problem is obtained. Speech therapy per se is not likely to be needed with the average athetoid. The speech therapist needs to be able to deal with such problems as overprotection, non-acceptance, lack of security, improvised communication systems, etc., rather than teach proper lip and tongue movement or other mechanism performance.

Improvement in physical development is of great importance. This includes the development of the use of the limbs, particularly the hands, inducing proper breathing and encouraging chewing, sucking, and swallowing movements.

An integrated program of speech therapy, physical therapy, and occupational therapy appears almost adamant in any speech rehabilitation program for the athetoid.

Treatment of Paraplegia Resulting from Trauma to the Spinal Cord

L. W. Freeman, M.D., Ph.D., Indianapolis. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 140:11: 949, July 16, 1949.

The essentials in the care of the patient suffering from a paralysis of the legs resulting from injury to the spinal cord consist of the prompt application of the following points:

(1) Rotation or flexion of the spine should be studiously avoided or the spinal cord may be severed.

(2) The deformity of the spine should be promptly reduced by traction or hyperextension or both.

(3) The patient must be turned every two hours at least.

(4) Proper care of the bladder includes: (a) Avoidance of distention or continuous contraction. (b) Encouragement of the development of an automatic bladder. (c) Avoidance of urinary sepsis, or prompt treatment if it occurs. (d) Prevention of urinary calculi by exercising upper extremities in bed and by early ambulation.

(5) Proper care of the skin. (a) Avoid prolonged pressure; turn frequently. (b) The bed should be clean, dry, smooth and flat. (c) Maintain adequate protein intake. (d) Large decubitus ulcers should be repaired surgically.

(6) Care of the bowels. (a) Relieve intestinal distention and constipation promptly, with: 1. Pituitrin or neostigmine. 2. Enemas and rectal tube. (b) Watch for and remove fecal impactions promptly. (c) Develop proper bowel habits.

(7) Watch for, prevent and, if necessary, promptly treat anemia, hypoproteinemia and vitamin deficiencies.

(8) Constantly be on the alert for complicating emotional reactions and help the patient to accept the reality of his difficulty.

As previously indicated, the skin will not tolerate long periods of pressure with concomitant ischemia. The question of trophic influences and other allied explanations are trivial in relation to pressure.

If a pressure area has developed, marked only by redness, it should be massaged with alcohol and sprinkled with powder. This advice is given with reservation, for the appearance of markedly reddened areas indicates that the patient cannot tolerate the amount of time that he was subjected to that degree of pressure. The tissues beneath a pressure area may become gangrenous without breaking down the skin, giving the appearance of a subcutaneous abscess. No amount of massage will retrieve gangrenous tissues. No ointment yet used has any advantage worthy of special mention. Yet, none will particularly retard the process of healing, and none should be marked for special condemnation. On the other hand, any substance believed to be beneficial should be used, for it certainly will help the sore get its proper attention—cleanliness. Dry treatment still remains the method of choice. For superficial sores, there is nothing superior to sunlight and fine mesh dry dressings. Skin grafts hasten the healing of these sores and provide a fairly good permanent covering.

The patient must be constantly reminded of the hazards of prolonged weight bearing. Eventually the patient will be the best one to determine how long he can maintain a given position without embarrassing his skin.

Treatment of Paraplegia Resulting from Trauma to the Spinal Cord (Continued)

L. W. Freeman, M.D., Ph.D., Indianapolis. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 140:12: 1015, July 23, 1949.

Flexor spasms are an almost constant occurrence in patients with injury to the spinal cord, and only those with destruction of the distal segments show continued flaccidity. Obviously, patients with injury of the cauda equina will not show spasticity unless the cord is damaged, and then the spasms are limited in nature. Reflexes begin to appear before the sixth week and often are of the withdrawal type by that time. If voluntary motion is to reappear, it will have done so before this time in the majority of patients. It might be noted that it is not uncommon for the patient, his nurse or even his physician to be misled by reflex movement of the paralyzed extremities. Early, the appearance of such movement often is misinterpreted as the beginning of the return of voluntary motion. Aside from this, it is of importance to note the time of appearance of such phenomena as the Babinski response (dorsiflexion of the great toe, often with spreading of the toes). When this phenomenon or any other reflex action is seen within hours after injury to the spinal cord, it can be assumed that the spinal cord lesion is incomplete. This might alter the opinion somewhat as to the type of therapy. However, this response (Babinski) or any other reflex response has no significance as to prognosis at any other time. Extensor responses have been widely heralded as indicative of incomplete lesions. However, it is not unusual to find extensor responses in the presence of complete anatomic transection of the spinal cord. This point has not attracted sufficient attention and must be stressed.

Once flexor spasms begin, their course is largely determined by many factors. Not the least of these is the presence of complications such as decubiti or infections of the urinary tract. It is likely that either of these will

initiate sufficient afferent impulses to extinguish the pattern of extension. The more primitive pattern of reflex withdrawal will obtain, with the semifinal stage being represented by paraplegia in flexion. If the patient is kept in good health, extensor reflexes will appear in almost every patient with a complete transverse section of the spinal cord. Thus, a favorite prognostic sign of old loses much of its significance. The often-heard phrase that flexor spasticity wears out after a year can hardly be passed on without almost prohibitive reservations. That reflexes will not become worse after a year in a healthy paraplegic patient is a fact. However, once flexor reflexes become well established, they diminish only to a basic minimum.

In a series of cases of complete paraplegia physical therapy was used constantly for the patient with spasms. In many, Hubbard tank baths proved to have a relaxing effect, but in some the relaxation was followed in several hours by severer bouts of spasm. Deep massage proved to have little usefulness, but light massage was more efficacious. Ambulation often reduced spasm in incomplete lesions; in some complete lesions this was also true, although in most the violence of the spasmodic movements was increased.

Rehabilitation is the principal means of reaching the ultimate goal whereby the paraplegic patient accomplishes a reorientation to his disabled state and enters society again as a useful citizen. There is little agreement as to the percentage of patients with paraplegia who can reach this goal. As stated by Munro: "If he has been properly treated, every patient with a spinal cord or cauda equina injury who is intelligent and cooperative and has the use of the shoulder, arm and hand muscles can be made ambulatory; can have such control of the bladder and bowels as to sleep through the night without either getting up or wetting himself; can carry out ordinary activities throughout the day without soiling himself with feces or having to evacuate his bladder oftener than once every three hours; can lead a normal social life, and within the limits of his intellectual capacity, can earn a satisfactory living." This attitude is taken by most heads of paraplegia services and by Covalt.

In the present centers for the care of paraplegic patients, approximately 1,000 are still hospitalized. This puts over 50 per cent at home. A questionnaire sent to several hundred patients known to have been discharged indicated that the vast majority met the requirements for being designated as rehabilitated. Checking those who had not been rehabilitated against their data on intelligence and aptitude showed that many of them were deficient in these fields. Of those still in the hospital, many could leave if the factor of social security could be established. If a physician assumes that his job is ended with the healing of visible wounds, then rehabilitation will almost always fail. Rehabilitation must encompass every phase of human activity, or it will likewise fail. Thus, failures to date cannot be blamed on any deficiency in knowledge, but in the application of known methods. The simplest answer to the problem is to insure a hospital bed for each patient and to care for his immediate medical needs on a domiciliary basis, with the hope that the pathetic condition will not last too long. In the patient past middle age, it may well be that ambulation is impossible and that one must be content with care in bed. However, this is not true for the average younger patient or for many of the older ones in whom at least wheel chair ambulation usually is possible. Any failure to reach full rehabilitation in young intelligent patients should be blamed on the social order that permits medical apathy and ignorance of the possibilities.

Psychologic Rehabilitation—It is essential that the patient be told as soon as possible that he will never walk normally again and that he will have loss of voluntary control of his bowel, bladder and sexual function. The patient must have supreme confidence in the physician, for severe emotional trauma results from a disinterested physician's telling the patient of his prognosis or relying on the family to convey the bad news. At the same time that the prognosis for voluntary function is given, a careful outline of the possibilities in rehabilitation should be given. Without this opening approach, it is difficult to get the patient started on the course to rehabilitation.

Physical Rehabilitation and Bracing—To care for himself completely, the paraplegic patient requires almost herculean shoulders and arms. In the first two weeks after injury, complete bed rest is advisable. The patient should be transferred to an exercise mat, preferably raised from the floor to ease the task of the physical therapist and instructors. Flexion of the spine should be avoided during the period of bony healing. Obviously, if laminectomy has not been performed, initiation of activity must await evidence of bony healing. Push-ups, pull-ups in the prone position and gripping exercises should be instituted. With a graded exercise system such as that described by de Lorme, it is possible to have almost every patient capable of supporting his weight with one arm in a period of six weeks. During this time, the patient is allowed in a wheel chair, provided that adequate bracing of the bony lesion is obtained. As soon as bony healing is demonstrated (and before in the patient with a proved anatomic transection), weight bearing should be allowed. This should be anticipated by enough time to allow measurement, manufacture and fitting of braces.

Ambulation—With the patient having reached the stage where weight can be borne on the extremities, the erect posture should be assumed between parallel bars. The bars should be adjusted to the level of the hand grips on the crutches. Here the patient learns balance and launches on the preliminary crutch-walking gaits of swing-to and swing-through. With full length mirrors at each end of the walking ramp, the patient is taught balance without requiring direct observation of the position of his feet. During this period he begins balance exercises with crutches, learning to throw the crutches forward and backward, and to shift the position of the crutches and body from side to side. He then begins forward motion with the crutches, with men stationed before and behind to prevent his falling. The swing-to gait is first mastered and then the swing-through. In all phases of daily care, he must reach proficiency in full accomplishment without aid. If he is dependent on outside aid for anything, his activity is likely to be too restricted. Emphasis is placed on full self-care.

Summary—Emphasis is placed on the following features: (a) immediate first aid care of the patient, (b) reduction of the deformity of the spine, (c) frequent rotation of the patient to prevent decubitus ulcers, (d) prompt bladder treatment, (e) attention to protein balance, (f) care of the bowels and (g) psychologic aspects. Details are given for bladder care, bowel care, nutrition, psychologic aspects and ambulation.

Ambulation is stressed for its general health value and as the only certain means for prevention of urinary tract calcinosis. Rehabilitation is discussed as a means of reaching the ultimate goal, whereby the paraplegic patient accomplishes a reorientation to his disabled state and enters society again as a useful citizen.

Medically Prescribed Exercises for Neuropsychiatric Patients: The Veterans Administration Program

A. B. C. Knudson, M.D., and John Eisele Davis, Sc.D., Washington, D. C. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 140:13:1090, July 30, 1949.

The present patient load in neuropsychiatric hospitals, the future load based on past experience and the large number of World War II veterans offer one of the greatest challenges in Veterans Administration medicine.

It is extremely important to begin corrective therapy as early as possible for achievement of the best results; this insures an adequate outlet for the patient's interest, time and energy; it satisfactorily substitutes activities for the patient's inactivity, and thus initiates constructive efforts toward ultimate rehabilitation.

Provision is made for the employment of naturally motivated activities in the form of exercise and play for the purpose of carrying out medically prescribed treatment. Major emphasis is placed on attracting the patient into activity and sustaining his interest in continued participation. Multiple grades and types of exercise are used. The corrective therapist, as has been indicated, is part of the total therapeutic team working under the supervision and direction of the psychiatrist and physiatrist, making ward rounds, reporting to them and regularly attending staff conferences. Activities are classified as to form, socialization and also application to disease entities when this is practicable within the range of our increasing experience.

Physical exercises providing a psychologic follow-up to electric shock therapy are differentiated for preshock and postshock categories, are administered daily for approximately one hour and are started about eighteen hours prior to shock.

Experience has developed the following general objectives: (1) relief of body soreness, (2) reawakening of confidence and aggression, (3) sedation and stimulation through swimming, (4) development of coordination, muscle tone and strength and (5) fundamental skills.

Corrective therapy is part of the well rounded program of physical medicine rehabilitation for patients who have undergone leukotomy. The patient who has undergone leukotomy is seen in the Corrective Therapy Department about the fourth postoperative day. Two or three weeks usually pass before interest and rational effort are elicited, during which time the patient may become motionless and seclusive or may participate in some elemental activity, as playing catch with almost any type of ball. The patients usually go through a period of aggression during the improvement phase, during which they are able to find helpful outlets through corrective exercise. Patients become naturally divided into two groups, fast and slow, the former comprising those whose operation was performed as long as a year previously, while the slow group comprises those operated on more recently.

The general results of leukotomy combined with postoperative psychiatric and physiatric therapy indicate that about one-third of the patients are able to return home, one-third improve in the hospital and one-third show no improvement or become worse.

There is a definite trend in all of the Veterans Administration neuropsychiatric hospitals to lay greater stress on the value of motivated exercise situations as adjuncts to psychotherapy. Total push programs utilize all possible facilities and types of therapy executed by the entire therapeutic team.

It is too soon to evaluate definitely the net results of many of the technics in corrective therapy, but their value already has been proved in many psychiatric illnesses.

Just as physiologic effects of exercise may aid in reestablishing former patterns of motion in neurologic conditions resulting from lesions of the central nervous system, so in psychiatric disease new behavior patterns are developed by corrective methods which can be guided by the psychiatrist and the physiatrist advantageously toward normal behavior and eventual recovery.

In physical medicine it may be several years before the exactness of dosage of various procedures will be definitely established as compared with pharmaceutic dosage. Likewise, in corrective therapy the surface of the possibilities in this field have barely been scratched. Much remains to be done in the proper evaluation, observation and study of various methods so as to derive the optimal type, frequency and duration of dosage for various mental conditions.

Corrective therapy in the Veterans Administration has stimulated a renaissance of interest and a concerted attack in this field throughout neuropsychiatric hospitals on the problem of the best methods of treatment of mental illness with prescribed activity. Psychiatrists are viewing progress along these lines with interest and anticipation.

Corrective therapy has proved its usefulness in the psychiatric field through its application to mental illness as a dynamic adjunct to psychotherapy and as a component section of total rehabilitation in coordination with other rehabilitation sections of the physical medicine rehabilitation service.

Corrective therapy has been of definite therapeutic value in its specialized application in catatonic patients and for postshock and postleukotomy conditions.

Corrective therapy offers new avenues of approach to the rehabilitation of aged patients with chronic mental illness.

The further practical application of the principles of corrective therapy, based on observation, research and evaluation of progress, should lead to new and even more beneficial results.

Studies of Deep Circulatory Response to Short Wave Diathermy and Microwave Diathermy in Man

Frederic J. Kottke, M.D., Donald W. Koza, M.D., William G. Kubicek, Ph.D., and Mildred Olson, B.S., Minneapolis, Minnesota. In ARCHIVES OF PHYSICAL MEDICINE, 30:7:431, July 1949.

The local response to an increase of tissue temperature generally has been considered to be an increase in local circulation and metabolism. Generally with a normal vascular system the increase in circulation is greater than the increase of metabolism, resulting in better nutrition of the tissue cells and more adequate removal of metabolites. These changes are considered to be the basis for the beneficial effects of thermotherapy. It has been demonstrated that diathermy is effective in heating deep tissues of the body.

Although increases in temperature at considerable depth have been demonstrated, studies of the concomitant changes of deep circulation do not indicate that the response to deep heating necessarily corresponds to the changes accompanying superficial heating. Studies of circulatory changes in the extremities in response to heat do not always agree. Here there are two general types of tissue, skin and muscle, either or both of which may

show circulatory changes. Direct heating generally increases the circulation as indicated by plethysmographic studies, but the site of increase is unknown.

The circulation of the kidney has been demonstrated to respond to direct heating by long wave diathermy with vasodilatation and increased blood flow. Eppinger and his co-workers found that when electrodes were applied directly to the surface of the kidney of the anesthetized dog the blood flow would increase in proportion to the heating. Since the blood flow in the kidney can be measured by clearance technics, the opportunity is provided to study the effects of various types of heating on the deep blood flow in human subjects.

Heating with microwave diathermy had the same effect on renal circulation as heating with short wave diathermy.

It appears that there are two distinct types of response of the body to heat. Local intense heating in a circumscribed area of the surface of the body, by stimulating temperature sensitive endings and increasing metabolites, causes local vasodilatation and increases local circulation. Under these conditions heat is rapidly removed from the heated area and the local increase of tissue temperature is much less than it would be if there were no circulatory response. Because of the increased circulation, the superficial tissues are protected against thermal damage and there is little penetration of heat to the deeper tissues. On the other hand, when large amounts of heat are applied to the body, the predominant reflexes are concerned with dissipation of heat from the body. Cutaneous vasodilation occurs with flushing, sweating and an increased skin temperature increasing the rate of heat loss from the body surface. To maintain the blood pressure in the face of this increased peripheral circulation cardiovascular readjustments are necessary. The pulse rate and cardiac output increase. Vasoconstriction occurs in the vascular beds not concerned with heat loss, such as the splanchnic and renal beds.

Response of the renal circulation to heating with short wave diathermy and microwave diathermy was studied in healthy young adult subjects. Heat applied to the back by both types of diathermy resulted in a significant decrease of renal plasma flow and glomerular filtration without significant changes of blood pressure. Insofar as renal blood flow may represent the deep circulation, it appears that diathermy heating causes a decrease in deep blood flow. The factors in local and systemic circulatory responses to heating are considered.

Rehabilitation of the Chronic Medically Ill

Otto Eisert, M.D. In ARCHIVES OF PHYSICAL MEDICINE, 30:7:441, July 1949.

From this study it can be seen that over 90 per cent of these patients with chronic medical conditions were rehabilitated, at least to the extent that the amount of required attendant and nursing care was greatly reduced and ultimately to the point that most of them could go home. In this series, 64 per cent were discharged from the hospital. In the past, the patients' families frequently were informed that the prognosis was hopeless and that the patients had become more or less custodial problems. Little or no treatment was instituted, and this led to increasing apathy, loss of morale and lack of desire on the part of the patients to improve. Frequently their limbs became fixed in useless positions, and bed sores developed. With the physical medicine rehabilitation program this situation was changed to the extent that the wards became cheerful, the patients became more interested in life and the morale of the medical staff improved. The families were invariably delighted at the patients' improvement and subsequent discharge from the hospital.

In this connection, it appears that, in addition to the physical medicine rehabilitation program for inpatients, a good outpatient program is necessary to provide for continuity of treatment following discharge. With such a program many patients who in the past had to remain in the hospital would be enabled to go home much earlier. Transportation should be provided to facilitate treatment in the outpatient department.

Common sense, ingenuity and perseverance are necessary in the treatment of patients with chronic conditions. The physician in charge must at all times maintain an attitude of optimism, which, in turn, will be communicated to the patients. Each case presents individual problems. In one case, a patient with bilateral cerebral thrombosis, who had been bedridden for many years, received the necessary amount of muscle reeducation and strengthening but was unable to stand because of a marked tendency to fall backward. This was counteracted by increasing the height of his heels, so that the center of gravity was shifted forward. Later, when the patient acquired good equilibrium and muscular control, the heels were lowered gradually until they were of normal height.

A group of trained personnel working under the direction of the physiatrist is extremely essential. There must be close collaboration among the various members of the group. Each patient must be treated individually. It is the details in diagnosis, details in medical and surgical care and details involved in the physical medicine rehabilitation program which are essential to produce the best ultimate results. Finally, rehabilitation of patients with chronic conditions should be undertaken without consideration of the length of their previous hospitalizations or the ultimate prognosis of the disease.

Summary

1. Rehabilitation is of primary benefit to patients with chronic medical diseases, as indicated by improvement of 90.9 per cent of the patients in a series of 128 and discharge of 74 per cent.

2. Nursing and attendant care is reduced, and hospital beds may be released for other patients.

3. Patients can take care of themselves for the remaining years of their lives and reacquire a certain amount of independence.

4. The families, in turn, feel that the patients are not necessarily hopeless invalids and welcome their improvement.

Peripheral Nerve Injuries from Administration of Penicillin: Report of Four Clinical Cases

Thomas Ray Broadbent, M.D., Guy L. Odom, M.D., and Barnes Woodhall, M.D., Durham, N. C. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 140:12: 1008, July 23, 1949.

This report describes the clinical course of four patients in whom there developed a peripheral nerve lesion immediately following the administration of penicillin into or about a peripheral nerve. This penicillin-induced lesion was characterized by the rapid onset of severe tingling pain of short duration, a pronounced and only slowly improving motor disability and a moderate inactivation of sensory axones.

Four cases of injury to a major peripheral nerve by penicillin injections are reported. In view of the established toxicity of this antibiotic in other parts of the nervous system, it is assumed that this neuritis represents a specific reaction to a high concentration of penicillin.

Right- or Left-Handedness: A Practical Problem

R. S. Eustis. In NEW ENGLAND JOURNAL OF MEDICINE, 240:241, February 17, 1949. Abstracted in JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 140:11: 986, July 16, 1949.

Eustis points out that the physician who is asked whether it is safe and wise to train an apparently left-handed child to use pencil and pen with his right hand can find good authority in the literature for almost any answer he may choose to give. Eustis believes that many apparently left-handed primary grade children may be successfully taught to write with the right hand. When writing begins they should all be so taught, because the use of the right hand fits in better with the left to right direction of writing and also because it conforms to the custom of the majority and hence is easier psychologically. If, however, a child objects strenuously or shows signs of nervous strain, of which stuttering may be one, the attempt should be abandoned at once, and he should be allowed to use his left hand without criticism. Those who are taught to write with the left hand should be shown the proper position of the paper, which is slanted with the top border to the right instead of to the left as is usual. It often is necessary to drill them in the use of this position, since otherwise they are likely to imitate their righthanded neighbors. They also should be allowed to write with a slight backhand slant if they so prefer.

The Prevention of Postural Deformity After Thoracoplasty

Bert A. Treister, M.D., Chief, Physical Medicine Rehabilitation Service, Veterans Administration Hospital, Brecksville, Ohio. In ARCHIVES OF PHYSICAL MEDICINE, 30:7:446, July 1949.

Thoracoplasty is the most efficient means of effecting permanent collapse of the lung in advanced pulmonary tuberculosis with cavity. This operation, usually carried out in multiple stages, entails the removal of several ribs and their adjacent transverse processes on one side of the chest. The removal of these bones detaches important muscular structures from their normal sites of insertion, thus disturbing their function in maintaining normal lateral stability of the spine. The imbalance thus produced initiates the development of a marked postural deformity, which, if unchecked by treatment, grows progressively worse.

My purpose in instituting a posture program at this Veterans Administration Hospital was to attempt to prevent or minimize the marked postural deformity that follows thoracoplasty. This program was prompted by the numerous complaints registered by patients who, having had the operation elsewhere, were admitted here because of recurrent disease. Their deformities usually were severe. They complained of pain in the chest, limited range of motion in the shoulder, awkward appearance and difficulty with wearing clothing. Since marked postural deformity creates social and vocational handicaps superimposed upon those created by tuberculosis, it is apparent that it is necessary, wherever possible, to minimize such deformity.

It is generally recognized that good posture is associated with good health and poor posture with poor health. The maintenance of good posture depends upon several factors, one among which is habit. Unnatural postural attitudes assumed for long periods, day in and day out, whether while standing, sitting or lying down, may lead to abnormalities which later become permanent. This results, perhaps, from the development of conditioned reflexes, the postural muscles becoming conditioned to the abnormal attitude. Another factor in poor posture can be muscular imbalance. This probably is the major cause of the deformity in posture occurring after thoracoplasty.

The posture program in this hospital is divided into two phases. The first of these deals with all patients; the second, with those having thoracoplasty. In the early stages of treatment patients spend many long weeks at complete bed rest. They often lie in bed with one or more pillows causing constant forward flexion of the head. When such a patient becomes ambulatory, he may become conditioned to this postural attitude and demonstrate a round shouldered posture. Prolonged reclining on a soft bed in the supine position leads to strain of the lumbar muscles. To prevent postural abnormalities in such patients, they are instructed to lie flat in bed without pillows during the organized rest periods each day. To insure further relaxation, the knees can be flexed and the patient's pillow placed under the knees. A rolled-up towel under the lumbar curve relieves this strain.

When the patient becomes ambulatory, his standing posture is analyzed and abnormalities detected by the physical therapist. Advice for correction is given. During his entire hospitalization, the patient is reminded of the importance of posture. Large posture mirrors are located on all floors opposite the patient elevators. These carry posters with hints on how to attain good posture. Posture mirrors also are located in all patient lavatories and shower rooms.

The second phase of the posture program deals with the prevention of postural deformities after thoracoplasty. Review of the early postoperative films of those patients admitted with already marked deformities of the spine reveals that the deformity begins to develop within a few days after the removal of the first two or three ribs in the first stage of the operation. Therefore, measures employed to prevent deformity must be instituted early. That early tendency to deformity may be prevented can be demonstrated roentgenologically.

A procedure to prevent postural deformity after thoracoplasty must take into consideration the importance of rest in the treatment of the underlying disease. Hence, passive measures are preferable, for the most part, to minimize exertion on the part of the patient.

The patient who is to have a thoracoplasty is visited preoperatively by the physical therapist who orients him as to the importance and aims of the procedure. He is advised to develop the "feel" of a straight spine while lying on his back in bed and assisted in assuming the position correctly. In general, he should lie on his back postoperatively for as long a period as is consistent with his comfort. To counteract the tendency to lateral flexion in the cervicothoracic region toward the unoperated side, he is instructed to keep these flexors stretched by approximating the ear on the operated side to the shoulder on the same side. He routinely assumes this position while lying on his back, for two hours in the morning and two hours in the afternoon and as often in between time as is compatible with his comfort. To supplement these measures and also to prevent adaptive shortening of the elevators of the shoulder on the operated side, he is instructed to make voluntary attempts frequently to depress this shoulder directly downward.

Two or three days postoperatively, depending upon the patient's general condition, passive movement of the shoulder, especially in abduction, is carried out daily. This, after a few days, is followed by active movement.

Resume of Skin Diseases Most Commonly Seen in General Practice

Everett C. Fox, M.D., and Thomas L. Shields, M.D., Dallas, Texas. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 140:9:763, July 2, 1949.

Tinea Capitis—These patients should be examined by the physician at one to two week intervals with filtered ultraviolet rays to determine accurately improvement or progression. When manual epilation of the infected hairs is carried out under the Wood light, more rapid improvement may be obtained.

Psoriasis—The chronic nummular lesions usually will respond to 5 to 10 per cent ammoniated mercury ointment or ammoniated mercury and sulfur, 5 per cent each, or 5 to 10 per cent crude coal tar ointment followed by ultraviolet rays as advised by Goeckerman. Roentgen therapy should be used only for the more resistant lesions, because of recurrences and chronicity of the disease. After two or three roentgen treatments, ultraviolet rays and tar ointments are used for prolonged therapy.

Pityriasis Rosea—The disease is self limited and runs its course in three to twelve weeks. This period may be decreased by treatment with antipruritic lotions, starch baths and ½ erythema doses of ultraviolet rays every five to seven days for two or three treatments.

Changes in Joint Temperature Produced by Diseases and by Physical Therapy: Preliminary Report

Joseph L. Hollander, M.D., and Steven M. Horvath, Ph.D., Philadelphia, Pa. In ARCHIVES OF PHYSICAL MEDICINE, 30:7:437, July 1949.

A relatively simple method of obtaining intra-articular temperatures has been devised as a means of determining the effect of various modalities of physical therapy on the joint and perhaps also for determining the amount of synovial hyperemia from a disease process. Increased heat in a joint after exercise may be an indication of the amount of cartilaginous degeneration present within the joint. Subnormal temperatures within a joint as compared with the skin temperature may be indicative of decreased circulation of the synovial membrane.

Forty-two determinations of the internal temperature of the knee joint and the overlying skin surface have been obtained on 35 persons.

A variety of physical measures were employed to modify the joint temperature. Simple passive and nonweight-bearing active movement of the joint was performed in instances.

Fever therapy, induced by a pyrogen injected intravenously, resulted in increased joint and surface temperatures.

Application of an infra-red heat source (baker) over the lower extremities for periods of thirty minutes results in slightly elevated joint temperatures.

Short wave diathermy (induction method, three turns of the coil around the joint), in patients who were able to tolerate this mode of therapy, produced elevated temperatures. The surface temperatures were elevated to a greater extent than the deep temperatures. A microwave diathermy apparatus was employed in 9 patients. There was a greater elevation of the internal temperature than of the surface temperature, confirming the previous observations of Horvath and co-workers on the heating of muscular tissues.

Observations were made on the influence of hot and cold packs on both normal and inflamed joints. The application of hot packs invariably resulted in a depression of the intra-articular temperature as much as 2.2 degrees F. Continued reapplication of these hot packs produced steadily diminishing effects, but even after the tenth pack of a series the joint temperature was still definitely lowered. The internal temperature quickly returned to control levels after discontinuation, and five to ten minutes later the values were slightly higher—a positive reflex effect. Cold packs, on the other hand, increased joint temperatures to a corresponding degree. A reflex effect in the same direction was observed in the opposite knee joint in 1 patient so studied (i.e., depression of internal joint temperature with heat and elevation with external cold to the opposite knee). The effects of this mode of physical therapy on joint temperature were not so marked in the summer as in the winter.

Application of paraffin to the extremities caused a sharp rise of skin temperature over the joint with a delayed but marked rise in the temperature inside the joint. The effects of hydrotherapy on joint temperature were not pronounced, even though the skin temperature was increased rather definitely.

Studies are being carried out on the effect of exercise, particularly weight-bearing exercise, on the temperature within the joint. The rate of cooling on rest following activity may shed some light on the clinical phenomenon of the "friction effect" and "articular jelling" so commonly found in degenerative joint disease.

Classification of heating modalities by their effect on joint temperature is now possible. This method of determining temperatures also may prove to be a means of measuring the efficiency of circulation in the synovial membrane. It has not yet been shown that raising the joint temperature in treating arthritis is necessarily beneficial; in fact, in cases of active arthritis the forms of physical therapy which raise the temperature most (i.e., short wave diathermy, microwave and paraffin applications) clinically appear to aggravate pain in the acutely involved joints. It is interesting that cold, pain, fear and even smoking all lower the skin temperature and raise the joint temperature appreciably. Reevaluations of modalities of physical therapy chosen for treatment in rheumatoid arthritis should be made with the actual reaction of the joint in mind rather than on purely surface temperature changes, since it has been observed in this work that the changes in joint circulation do not parallel those in skin but frequently are directly opposite.

Care of the Paraplegic

From Current Comment. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 140:12:1032, July 23, 1949.

THE JOURNAL, during the last two weeks, has published an extended consideration of the care of the paraplegic patient. The National Paraplegic Foundation, which is concerning itself particularly with veterans who have suffered from these seriously disabling injuries, sponsored the article through its medical advisory committee. Among the agencies that have been concerning themselves particularly with the paraplegic patient is the 52 Association, Inc., organized with the specific purpose of doing everything possible to make life worthwhile for the veteran who has become disabled through injuries to the spine that make the lower half of the body incompetent. Any physician who reads the intensive detail involved in the scientific care of such patients will realize that laymen who devote their time, their funds and their efforts to bringing some happiness into the lives of those who have given of themselves so fully toward the winning of the war deserve the utmost encouragement and assistance. The 52 Association deserves support, particularly by physicians who know how important is the mental attitude of the disabled patient.

Diagnostic Clinic for Rehabilitation

A. R. Shands, Jr., M.D., Wilmington, Del. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 140:11: 937, July 16, 1949.

With insufficient information and an inaccurate diagnosis a patient may start a program of rehabilitation totally unsuited to his handicap; hence the first major division in the organization of services for the rehabilitation of the handicapped is the diagnostic clinic. The physical qualities, mental characteristics and vocational abilities of the patient must be determined, recorded and evaluated before treatment is started. Then and then only can a rational plan leading to the restoration of this handicapped person to the best possible physical, economic and social status be formulated. The purpose of this paper is to present a few ideas on the organization and value of the diagnostic clinic for rehabilitation with several related thoughts on other problems of rehabilitation.

It must be remembered that rehabilitation is an individualized process and will never lend itself to fixed and stereotyped programs. Each case represents a separate problem, which has to be studied and judged on its own merits; hence the need for an accurate diagnosis.

In the physical medicine branch there should be a physiatrist, who is the physician trained in physical medicine, and a physical therapist, who has had special training in muscle examinations and determination of joint motion. In all of the patients with orthopedic handicaps who need rehabilitation there is some involvement of muscles and joints which must be properly examined and their functional value estimated before a sound program of rehabilitation can be decided on; hence the need for the special training of the physical therapist.

There is no doubt at present that rehabilitation is poorly understood. Few of us feel competent to practice it, and there is a vast job of education needed to bring the importance of the knowledge newly gained to the mind of the average physician. With greater experience, there will come a time when all physicians will feel a degree of confidence in what can be done for their patients with good rehabilitation and will not consider themselves educated until they know the technics and are masters of the practice of this "third phase of medicine."

The Problem of Medical Care for Navajo Indians

Michel Pijoan, M.D., and Charles S. McCammon, M.D., Fort Defiance, Ariz. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 140:12:1013, July 23, 1949.

Recently considerable comment has been made regarding the health services rendered to Navajo Indians, apparently because the Navajo tribe (numbering approximately 65,000 persons) is the largest Indian tribe in this country and the health services rendered are far from adequate. Several factors enter into this: that the geographic domain of this tribe is large, that travel is difficult, that their culture differs from ours and that the few physicians ordinarily employed have little or no conception of cultural differences or are insufficiently trained to carry out medical inquiry and care of the sick. These, and other similar or contingent criticisms, appear warranted. But statements made with reference to the scarcity of certain diseases among the Navajos are based on insufficient evidence or the lack of diagnostic procedures; such concepts are the cause for much speculation and concern and should be reconsidered in the light of modern medicine.

The tuberculosis situation needs immediate attention, and facilities should be made available for the care of the tuberculous patient. Here, again, affiliation with institutions specializing in this type of medicine is of supreme importance.

To date the problem of giving medical care to the Navajo Indians is a challenging one and deserves careful study and effort rather than the emotional approach used by many persons. The formula for rendering medical aid to Navajo Indians is by no means solved—advice, criticism and help are solicited and, if given with careful thought, will be greatly appreciated. It is to be remembered that the Navajos have a rich and creative culture and that any program developed must in great measure consider their way of life.

Axon Branching in Nerve Regeneration and Its Trophic Effect on Muscle

Robert W. Thomas, M.S., and Harold A. Davenport, M.D. In QUARTERLY BULLETIN OF NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, 23:2:170, Summer 1949.

The ingrowth of nerve fibers from the cut end of the external sural into the distal stump of the common peroneal nerve, in the rat, was characterized by abundant bifurcation. After intervals of four to 24 weeks for recovery, the average number of fibers in the regenerated peroneal nerve was about three times as many as the number in the external sural, which was the sole source for regenerating axons. Regeneration from the proximal stump of the common peroneal was effectively prevented by Edds methods of capping with methacrylate.

The trophic support of peroneal muscles by motor fibers from the external sural was good, in that the weights of the muscles after 12 to 24 weeks for recovery was at least equal to, or somewhat greater than, the weight of muscle originally supplied by this nerve. Recovery weights of peroneal muscles were 50-70 per cent of normal weights, obtained by using the opposite side for controls. Considering the small number of motor fibers available for reinnervation, this seems to be evidence in favor of the physiological effectiveness of axons branching during regeneration.

Book Reviews

New Hope for the Handicapped: The Rehabilitation of the Disabled from the Bed to Job. *By Howard A. Rusk, M.D., Professor and Chairman of the Department of Rehabilitation and Physical Medicine, New York University College of Medicine; Associate Editor,* THE NEW YORK TIMES, *and Eugene J. Taylor, Instructor, Department of Rehabilitation and Physical Medicine, New York University College of Medicine; Editorial Staff,* THE NEW YORK TIMES. *Foreword by Bernard M. Baruch. Cloth. Price, $3. Pp. 231. Harper and Brothers, 49 East 33rd Street, New York 16, 1949.*

The foreword by Bernard M. Baruch states: "My interest in the conservation of human resources . . . dates back to my early years. My father, Dr. Simon Baruch, as a physician, was particularly interested in the problems of chronic disease, hydrotherapy and the medical activities which are today called rehabilitation." Doctor Rusk, during the war, was Chief of the Army Air Forces Convalescent Services Division with the rank of colonel. He was awarded the Distinguished Service Medal in 1945. He is now Consultant in Rehabilitation in the Department of Hospitals of the City of New York, the Veterans

Administration and the Secretariat of the United Nations. Prior to military service, Doctor Rusk was engaged in the practice of internal medicine in St. Louis, Missouri, where he also was Instructor in Medicine at Washington University, and Associate Chief of Staff at St. Luke's Hospital. During World War II, Mr. Taylor was Chief of the Education Branch, Convalescent-Rehabilitation Division, Army Air Forces, and is at present Consultant in Rehabilitation to the Veterans Administration.

In this book there are thirteen interesting chapters on the rehabilitation of both medical and surgical patients. In a chapter entitled "Tomorrow's Problem," the authors close with a quotation: "The society which fosters research to save human life cannot escape the responsibility for the life thus extended. It is for science not only to add years to life, but more important, to add life to the years."

This book, written by Doctor Rusk, who is one of the leaders of rehabilitation in the United States, should be read by all physical therapists who are an important part of the team working in the rehabilitation program.

Introduction to Human Anatomy. *By Carl C. Francis, A.B., M.D., Assistant Professor of Anatomy, Department of Anatomy, Western Reserve University, Cleveland, Ohio. Cloth. Price, $5.50. Pp. 470, with 313 illustrations and 35 color plates. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1949.*

In this textbook the author presents in the smallest possible space what he considers the essential facts of human anatomy. Stress has been laid on the function of each part and on the integration of each tissue and organ of the body.

Psychiatry in a Troubled World. *By William C. Menninger, M.D., Secretary of the Menninger Foundation, Topeka, Kansas. Cloth. Price, $6. Pp. 636. The Macmillan Company, 60 Fifth Avenue, New York 11, 1948.*

The author played an important part in the development of psychiatry in the army during the recent war. This book is a record of the events psychiatrically speaking during that time which were obtained from first-hand information. It appears to be a faithful record of the mistakes and the commendable performances. There is no effort to gloss over the failures but they are presented not from a prejudicial personal point of view but rather to see what lessons could be learned. In addition, of course, the record of the triumphs is there to read.

The book is developed from the theme of what was known before the war about military psychiatry and how little of it was applied when it became necessary. It seemed that the same lessons had to be learned over again. From there the author points out the factors in military life which created problems requiring personal adjustment. Then the various categories of mental illness are discussed. The latter parts of the book deal with the application of the new lessons for the future reference in military psychiatry and several chapters discussing general aspects of psychiatry in peace.

This is one of the best-documented books that has come out of the last war. The conclusions are amply supported by facts and references. It is written in semi-technical language so that any well-read intelligent layman will have no trouble understanding it. In spite of this it is not too simple for any psychiatrist to find enjoyable.

The author deserves great praise for having made available this detailed and lucid report. It deserves wide circulation. It is to be hoped that it will not occupy a place on a library shelf and become forgotten just as have so many other things that were created from the holocaust that was World War II.

Essentials of a Hospital Department—Physical Therapy. *Paper. Pp. 36. The American Hospital Association, 18 E. Division St., Chicago, 1949.*

This manual was prepared under the guidance of members of a joint committee representing the American Hospital Association, the Council on Physical Medicine of the American Medical Association and the American Physical Therapy Association. Compilation of the material was made possible by a grant from the National Foundation for Infantile Paralysis to the American Physical Therapy Association. The manual is designed to supply broad guidance in planning, installing, equipping and administering a physical therapy department in a hospital, and it should prove to be a valuable guide to any hospital planning to establish a new physical therapy department or to enlarge one already existing.

Each hospital as an individual institution is confronted with its own unique need, abilities, services and problems but the suggestions and guides in this manual apply to common problems that all hospitals are likely to face in providing physical therapy services. Floor plans for general hospitals of 50, 100 and 200-bed capacity are given. These have been prepared by architects of the United States Public Health Service, Division of Hospital Facilities, in consultation with the committee representatives.

Hospitals, physiatrists and physical therapists will find this manual of great value in planning a hospital physical therapy department.

Fractures and Orthopedic Surgery for Nurses and Masseuses. *By Arthur Naylor, Ch.M., M.B., M.Sc. (Sheff.), F.R.C.S. (Eng.), F.R.C.S. (Edin.), Honorary Orthopedic Surgeon, Bradford Royal Infirmary and Bradford Children's Hospital; Orthopedic Surgeon, Bradford Municipal General (St. Luke's) Hospital, and Bradford Education Committee; Temp. Major Orthopedic Specialist. Foreword by Ernest Finch, M.D., M.S. (Lond.), F.R.C.S. (Eng.), Consulting Surgeon, Royal Infirmary and Hospital, Sheffield; Late Professor of Surgery, University of Sheffield. Second edition. Cloth. Price, $5. Pp. 296, with 251 illustrations. The Williams and Wilkins Company, Mt. Royal and Guilford Aves., Baltimore 2, 1948.*

In the preface the author states that the success of orthopedic surgery is dependent upon the knowledge, skill and care given by nurses and physical therapists to whom the after-care and treatment is delegated. In the treatment of adult patients with fractures and orthopedic disabilities it is important for the surgeon, nurse and physical therapist to treat them psychologically as well as surgically. They should be imbued with the desire to get well by constant encouragement from their medical attendants. By close cooperation between employers and the surgical team the patient should be gradually brought to a fit condition to perform his former occupation. While surgical and other treatment is progressing, exercises should be used to prepare him for ambulation and to give him confidence in the use of his injured limbs.

Those who will never be able to return to their previous employment need training for new occupations (vocational training). The author states that these processes are collectively known as rehabilitation but that rehabilitation is not a new form of treatment to be practiced by rehabilitation specialists. It is the mechanism of putting the patient in a position to follow his former or equivalent occupation by means of surgery, nursing, physical and psychological treatment through a cooperative program. Physical therapists will be interested in reading this account of rehabilitation in England.

Arthritis and Allied Conditions. *By the late Bernard I. Comroe. Fourth edition, revised and rewritten by 17 leading rheumatologists under the editorial direction of Joseph L. Hollander, A.B., M.D., F.A.C.P., Assistant Professor of Physical Medicine, Graduate School of Medicine, University of Pennsylvania; Associate in Medicine, School of Medicine, University of Pennsylvania; Chief of Arthritis Section, Hospital of the University of Pennsylvania. Cloth. Price, $16. Pp. 1108, with 370 illustrations. Lea & Febiger, Washington Square, Philadelphia 6, 1949.*

This book covers the entire field of rheumatic diseases. It is replete with authoritative advice and guidance on diagnosis, differential diagnosis and treatment of rheumatoid arthritis and allied conditions. The book is organized into ten parts. In this fourth edition every chapter has been revised with the addition of new findings and the deletion of obsolete material. There are new chapters on Collagen Diseases, Palendromic Rheumatism, Reiters Syndrome, Rehabilitation of the Arthritic Patient, Pregnancy in Arthritis, Rarer Forms of Metabolic Arthritis, and Joint Physiology. There are new discussions on Psychogenic Rheumatism, Physical Signs of Joint Disease, Normal Aging of Joints, Osteoporosis, the Shoulder-Hand Syndrome, Post-Gonorrheal Rheumatoid Arthritis, the newer methods of treatment of the various forms of arthritis. New chapters and new sections have been added on the dramatic discovery of the effects of Compound E and pituitary A C T.H. on rheumatoid arthritis and other rheumatic diseases.

Many of the features instituted by Comroe are retained, including the popular boxed summaries which are so helpful to those with limited reading time. The illustrations are good and 160 new ones have been added.

In this edition the text is brought fully up-to-date by outstanding specialists in this field. These authorities are all active in the American Rheumatism Association and most of them conduct arthritic clinics of their own, in addition to teaching the subject.

This book is for general practitioners and for all specialists who treat patients suffering from any of the rheumatic diseases.

Neurological and Neurosurgical Nursing. *By C. G. de Gutiérrez-Mahoney, M.D., Sometime Fellow of the Rockefeller Foundation; Associate Professor of Neurology, Vanderbilt University School of Medicine, Nashville; Senior Neurosurgeon, United States Army Air Forces (Colonel MC, A.U.S.), Director of the Neurological Division and Neurosurgeon-in-chief, St. Vincent's Hospital, New York City; Neurological Consultant, Fort Totten Army Medical Center, New York, and Esta Carini, R.N., B.S., Formerly Head Nurse and Supervisor of the Neurological and Neurosurgical Services, Neurological Institute Presbyterian-Columbia Medical Center, New York City; Clinical Instructor of Neurological and Neurosurgical Nursing, St. Vincent's Hospital, New York City. Cloth. Price, $5.75. Pp. 516, with 52 illustrations. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1949.*

The objective of this textbook is to provide instructions for an effective nursing program for the neurological and the neurosurgical patient. So far a suitable text has not been available. The material has been so organized that one may obtain the knowledge which is essential to give or supervise the special nursing care required by patients with neurological diseases. Emphasis has been placed on understanding and appreciating the psychological reaction of the patient to his disease and treating him as an individual rather than as a disease entity.

Chapter one gives an excellent but brief historical development of neurosurgery and shows that with the continued skill and refinements of neurosurgery provisions must be made for the training of more nurses in this specialized field. While the chapter is brief its brevity is well compensated for by the inclusion of eighteen well chosen references for further study. Chapter two presents the anatomy and physiology of the nervous system but, in which, there is no mention of the internuncial neuron. The chapter is well illustrated and ends with eight reference books for student use. Some of the other chapters are admission and discharge of the patient, diagnostic study of the patient, which is well outlined; care of the unconscious patient; developmental diseases; degenerative diseases and their nursing care. There is a chapter on infectious diseases including herpes zoster and it is to be regretted that there is no mention of the value of the compression bandage for treatment of severe postherpetic neuritis; convulsive diseases; intracranial tumors; diseases of cranial nerves. A chapter devoted to the medications most frequently used is very comprehensive. In addition, there is a splendid appendix which gives an excellent course outline for nursing schools. It gives the time to be devoted to the course of study, placement, teaching personnel, and discusses teaching methods. There is also a useful and valuable section devoted to the topical outline of units for study and the time to be given for their presentation. Each of these units is carefully outlined as to the subject matter to be studied. Seventeen units are presented. The appendix also gives a list of fifty good neurological textbooks as well as a list of twenty medical periodicals likely to be valuable in this field. It finally closes with a glossary of terms used most frequently in neurology and neurosurgery.

This textbook should prove of great value to anyone interested in the nursing care of the neurological patient. Certainly no nurses' training school would be complete without using this book as a text. It is of little value to the physical therapist except as a reference for correlation. The book is primarily for nurses and hence one can understand that attention given to physical therapy is not very extensive. However, physical therapy is mentioned frequently and one would expect the physical therapist would be asked to contribute and amplify this aspect of the nursing care during a course of study. Each chapter closes with a list of extensive references which amplifies the value of the subject matter in the text.

The subject matter of the text is lucid and well presented. This book is highly recommended for nurses and many physical therapists will find it profitable to study.

An Evaluation of Selected Schools of Nursing: With Respect to Certain Educational Objectives. *By Helen Nahm, Director of the Division of Nursing Education, Duke University, Durham, North Carolina. Paper. Pp. 97. Published for the American Psychological Association by Stanford University Press, Stanford, California, 1948.*

Educational institutions have been evaluated in the past largely in terms of facts regarding physical facilities, number of books in the library, number and qualifications of the faculty, total hours of classroom and laboratory instruction, and provisions made for the physical and social welfare of students.

This is a study of a number of representative schools of nursing and an evaluation of these schools based upon

data regarding the knowledge, skills, attitudes, abilities and personal characteristics of the students and graduates.

In this study Nahm chose to direct attention to the whole field of human relationships involved in professional nursing. The objectives selected were the satisfaction of the nurse with her profession, her democratic or autocratic beliefs and practices, her understanding and ability to apply mental hygiene in dealing with patients and others, her evaluation as a well-adjusted person, her range of social, cultural, political and recreational activities and her interest in social, political and economic problems and issues.

Knowledge, skills, attitudes, abilities and personal characteristics are of great importance in the profession of physical therapy and such a study as this is of interest to those engaged in physical therapy education.

Medical Etymology: The History and Derivation of Medical Terms for Students of Medicine, Dentistry and Nursing. *By O. H. Perry Pepper, M.D., Professor of Medicine, University of Pennsylvania. Cloth. Price, $5.50. Pp. 263. W. B. Saunders Company, West Washington Square, Philadelphia, 1949.*

This handbook was written in the hope of assisting medical, dental and nursing students to understand medical terminology. It is not a dictionary; it is concerned more with the origin and derivation of a word than with its meaning. Modern medical terminology includes words of great antiquity and also those of recent coinage. Less than five per cent of the words are of Anglo-Saxon origin, the remainder are from the Greek, Latin, Arabic, Semitic, French or Italian. Part I gives the background of medical terminology, the prefixes, suffixes and compounding elements used in medical terms. Parts II, III and IV are devoted to the derivation of nearly 4,000 words. An effort has been made to group these under subjects in the order in which they are met in the curriculum of the student.

This book will serve as an excellent reference book for physical therapy students who often find medical terminology confusing and difficult.

Nuclear Radiation Physics. *By R. E. Lapp, Ph.D., Research Development Board, Washington, D. C., and H. L. Andrews, Ph.D., National Institute of Health, Bethesda, Md. Cloth. Price, $6. Pp. 487, with illustrations. Prentice-Hall, Inc., 70 Fifth Ave., New York 11, 1948.*

This book is the outgrowth of an elementary manual written by Doctors Lapp and Andrews during the late war entitled "Radiological Safety" and later "Radiological Defense." A textbook such as this should prove invaluable to anyone interested in the fascinating field of nuclear physics. The authors have presented their material in a clear and relatively simple manner. While it would be impossible to deal with the subject matter without the use of mathematics, the authors have employed what is essentially a nonmathematical approach. At the end of each chapter there is appended a list of reference books and articles. The authors have happily combined with their discussion of the physics of nuclear radiations a consideration of the uses of radio-active materials as tracers and of the protection of the health of persons working in this field.

This volume should prove of marked interest to all biologists, physiologists and medical students. Such a book could be used to advantage as a text in all medical schools. The appendices at the end of the book contain a great amount of useful data. This book is highly recommended.

Rehabilitation of the Chronic Neurological Patient. *By A. B. Baker, M.D., National Consultation for Rehabilitation of Chronic Neurological Patients, J. R. Brown, M.D., Chief, Neurology Section, Veterans' Administration Hospital, Minneapolis, Minn. Paper. Price, 30c. Pp. 50, with 59 illustrations. VA Pamphlet 10-29, Veterans Administration. U. S. Government Printing Office, Washington, D. C., 1949.*

In the foreword Paul B. Magnuson, M.D., Chief Medical Director, Veterans Administration, states: "This monograph is one of the most encouraging pieces of information ever published by the Veterans Administration. . . . I believe it should be on the desk of every physician."

The rehabilitation of patients with neurologic disabilities would seem to be an obvious and necessary procedure. In the past, rehabilitation programs have been instituted for poliomyelitis and cerebral palsy with good results. In recent years there has been considerable advance in the treatment of other disabling neurological conditions although the importance of such a program has not been fully realized.

This pamphlet describes the possibilities and practical gains which have been demonstrated in a program of neurologic retraining conducted at the Minneapolis, Minnesota, Veterans Administration Hospital. It contains the program which was followed and its objectives, the neurologic examination, physical therapy procedures, social procedures, general discussion of certain specific disabilities, some special problems and an evaluation of results and interpretations.

Physical therapists will find this monograph of great value in the treatment of patients with neurologic disabilities.

Biological Reactions Caused by Electric Currents and by X-Rays: A Theoretical Study of the Phenomena of Excitation in the Nerve by Different Electric Currents and the Biological Reactions Caused by X-Rays, Both Based Upon a Common Principle. *By J. Th. van der Werff, M.D., D.Sc. Cloth. Price, $5. Pp. 203, with 38 illustrations. Elsevier Publishing Company, 215 Fourth Ave., New York 3, 1948.*

The author states this book is written for two groups of scientists; namely, the physiologist and the radiologist. The author makes an extensive use of mathematics which will prove a decided limitation for many readers. It is unfortunate that mathematics does not appeal as a necessary science to many physicians.

The book is essentially divided into three sections. Section one gives a general introduction and essentials in which the author introduces his hypothetical equation on metabolism. Part two deals with the electrical excitation of the nerve, and section three discusses biological reactions caused by X-rays. The author is dedicated to the thesis that the phenomena of excitation caused by electric currents and especially those of excitation of the nerve, and the biological reactions caused by X-rays are analogous to such an extent that it is highly probable that they may be explained from a common principle. The first section is given over to formulation of this principle in order to apply it to the two subjects discussed.

The author presents his subject matter well and it is not his fault that mathematics is used for it could not have been otherwise. For those with a good mathematical training this volume is highly recommended. It should prove of marked interest to physiologists with a sufficient mathematical background. It is not recommended to physical therapists.

Living Anatomy: A Photographic Atlas of Muscles in Action and Surface Contours. *By R. D. Lockhart, M.D., Ch.M., Regius Professor of Anatomy, University of Aberdeen, Aberdeen, Scotland. Cloth. Price, $4. Pp. 71, with 149 illustrations. Oxford University Press, 114 Fifth Avenue, New York 11, 1948.*

Probably no student of anatomy uses the clinician's method of study of muscles more than the physical therapist. Recognition of muscle action on the living normal subject is prerequisite to the detection of pathological muscle action. This book provides excellent photographs for the study of muscle contours and muscle action on the living normal subject, and would facilitate the study of functional anatomy so necessary to the physical therapist.

This book is an anatomical study containing 149 photographs of the living subject featuring the action of muscles. For the most part the muscles are shown in action by the resistance of movement between the model and the demonstrator, or between two models. The same action frequently is shown from slightly different aspects and by different models for comparison.

The book does not attempt to depict every muscle nor all the activities of an individual muscle, but rather, as the author states, "its purpose is to encourage the student's interest in the study of muscle action in the living body." Any student of functional anatomy, in particular, the physical therapist, will find this book a valuable aid.

Your Career—How to Choose a Profession and How to Prepare for It. *By Ed Cunningham and Leonard Reed. Aptitude Guide Prepared by Harold Cash, Long Island Psychological Service. Paper. Price, $1. Pp. 72. Simon and Schuster, New York, N. Y., 1949.*

In preparing "Your Career" the authors have attempted to obtain and present actual facts about the leading professional fields. In the introduction they advise prospective entrants to contact the professional associations, the editors of professional magazines or colleges and schools which specialize in the profession, for additional information. Information on 84 professions is given, including physical therapy, which is well presented.

Meet Our New Contributor

Stull, R. J., 38 Long View Drive, San Anselmo, California. Mr. Stull received his A.B. degree from Duke University, Durham, N. C., in 1940, and took postgraduate work in Hospital Administration in 1941-42. At the present time, Mr. Stull is the Director of Hospitals and Infirmaries, and Lecturer in the School of Public Health, University of California, San Francisco, California.

Classified WANT-ADS

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POSITIONS AVAILABLE

WANTED—PHYSICAL THERAPY CONSULTANT for position on staff of National Health and Welfare agency. Experience in the consultative phase of physical therapy essential. Public speaking ability and knowledge of program organization needed. Must be thoroughly familiar with all types of equipment. Should have experience in the several phases of crippled children's work. Cerebral palsy training desirable. Apply to National Personnel Registry and Employment Service, National Society for Crippled Children and Adults, 11 South La Salle Street, Chicago 3, Illinois.

WANTED—PHYSICAL THERAPIST—graduate of an approved school, for coordinator and physical therapist of a day school for cerebral palsied children. For further information write: Miss Jeanne Adams, Secretary, Kanawha County Society for Crippled Children, Charleston, West Virginia.